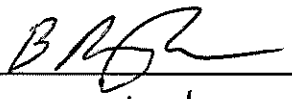
Bloomfield Colliery

Mining Operations Plan

2018 – 2020

TITLE BLOCK

Name of Mine:	Bloomfield Colliery
MOP Commencement Date:	July 2018
MOP Completion Date:	December 2020
Mining Authorisations (Lease / Licence No.):	ML1738, CCL761, AMA1001
Name of Authorisation/Title Holder:	Bloomfield Collieries Pty Ltd
Name of Mine Operator:	Bloomfield Collieries Pty Ltd
Name and Contact Details of the Mine Manager:	Brad Donoghoe Phone: 02 4930 2641 Mobile: 0418 923 058 email: bdonoghoe@bloomcoll.com.au
Name and Contact Details of Environmental Representative:	Greg Lamb Phone: 02 4930 2689 Mobile: 0457 819 211 email: glamb@bloomcoll.com.au
Name of Representative of the Authorisation Holder:	Brad Donoghoe
Title:	Mine Manager
Signature:	
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SUMMARY OF TABLES, FIGURES AND PLANS

A summary of the relevant tables and plans required under *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* is provided below:

ESG3 Requirement	Section of MOP	Table Reference	Plan Reference	Source
Material production schedule	Section 2.3.10	Table 4	N/A	Mine Planning MOP Guidelines
Domain selection	Section 5.1	Table 11	Plans 2, 3A - 3C, 4A & 4B	MOP Guidelines
Rehabilitation phases	Section 5.3	Table 13	Plans 3A – 3C	MOP Guidelines
Performance indicators and completion criteria	Section 6	Table 14	N/A	LMP MOP Guidelines
Proposed disturbance and rehabilitation activities	Section 7.2	Table 16	Plans 3A – 3C	Mine Planning MOP Guidelines
Summary of rehabilitation areas	Section 7.3	Table 18	Plans 3A – 3C	Spatial Data MOP Guidelines
Plans	Section 11	N/A	All Plans	Spatial Data MOP Guidelines

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APPENDICIES

1 Introduction

This Mining Operation Plan (MOP) covers the period July 2018 to December 2020. This document is the revised and updated MOP to supersede the January 2012 to December 2016 MOP for the Bloomfield Colliery. The MOP 2012 – 2016 was extended to October 2018 by variation on 22 June 2018.

The term of this MOP was determined after discussions with Division of Resources and Geosciences (DRG) having regard to the uncertainty for the operation surrounding the Abel Underground Mine entering care and maintenance (refer Section 1.1).

In accordance with the objective of the NSW DRG the following MOP has been configured to provide proper consideration to the environment during the operations stage through to 2020. This MOP has been prepared as a requirement of the Mining Lease conditions (ML1738, CCL761 & AMA1001).

The structure and content of the MOP have been formulated in accordance with DTIRIS *ESG3 Mining Operations Plan Guidelines, September 2013*.

1.1 History of Operations

Bloomfield Colliery is owned and operated by Bloomfield Collieries Pty Limited (Bloomfield) and is located approximately 20 km north-west of Newcastle in the Cessnock Local Government Area (Plan 1A).

Mining has been carried out at the present site since the late 1850's with Bloomfield taking over the Mining Lease in 1937. Underground mining operations on the site ceased in 1992 due to difficult mining and economic conditions. Open cut mining operations began in 1964.

Ashtonfields Pty Ltd owns the majority of the land at the site covered by ML1738, CCL761 and AMA1001 since the Bloomfield involvement in the operations began and a long-standing Commercial Lease agreement exists between the companies.

Approval for the Bloomfield Colliery was granted by the Minister for Planning on 3 September 2009 under Part 3A of the *Environmental Planning and Assessment Act, 1979*.

Plans 1B and 1C provides details of the site land use at the commencement of the MOP term. Approved activities include the continued operation of the following mine infrastructure and related activities:

- the current and future open cut mine areas;
- the workshop;
- the road between the open cut pit areas and the run-of-mine (ROM) coal;
- stockpiles at the washery; and
- the road that links the workshop, open cut pits and the washery.

The Approval provides for the extraction rate of up to 1.3 million tonnes per annum (mtpa).

Other mining infrastructure and activities at the Colliery include:

- the Coal Handling Preparation Plant (CHPP);
- the rail loading facility; and
- the tailings disposal dam.

This other mining infrastructure was approved under Project Approval 05_0136 for the Abel Underground Mine. Project Approval 05_0136 was issued to Donaldson Coal and was granted in June 2007. It allows for the Abel Underground Mine as well as the continued use of the Bloomfield washery and rail loading facility, management of water associated with the washery, coarse reject and tailings disposal and coal handling. These items, associated with the operation of the washery, are used to process coal from Bloomfield, Donaldson and other mine sources.

1.2 Consents, Authorisations and Licences

Table 1 shows the status of current leases, licences and approvals at Bloomfield Colliery relevant to this MOP.

Table 1: Leases, Licences and Approvals

Statutory Approval	Granted	Expires	Approval Authority
Mining Lease 1738	June 2016	2037	Department of Industry
Mining Lease CCL761	November 1991	2029	Department of Natural Resources
Ancillary Mining Activity 1001	August 2018	2037	Department of Planning & Environment
Project Approval PA 07_0087 Bloomfield Coal Project	September 2009	2030	Department of Planning & Environment
Project Approval PA 05_0136 Abel Coal Project	June 2007	2030	Department of Planning & Environment
Environmental Protection Licence No. 396	July 2000	Renewed Annually	Office of Environment and Heritage

The Project Approval (PA 07-0087) Conditions are provided in Appendix 1. Bloomfield Colliery is a Level 1 mine as defined in the MOP Guidelines (DTIRIS-DRE, 2013).

1.3 Land Ownership and Land Use

Ashtonfields Pty Ltd owns the majority of the land at the site covered by ML1738 & CCL761 since the Bloomfield involvement in the operations began and a long-standing Commercial Lease agreement exists between the companies (Refer Section 4.1.2).

A schedule of land ownership is provided in Table 2. Plan 1C provides details of the site land tenure at the commencement of the MOP term.

Land use in the vicinity of Bloomfield Colliery is characterised by a combination of coal mining operations, woodlands, agricultural operations, urban and semi-urban residential developments (Refer Plan 1B).

Table 2: Land Ownership

Lot No.	DP No.	Landowner
1	42349	Ashtonfields Pty Ltd
1	58967	Ashtonfields Pty Ltd
1	69246	Ashtonfields Pty Ltd
1	136865	Ashtonfields Pty Ltd
12	241097	Ashtonfields Pty Ltd
13	241097	Ashtonfields Pty Ltd
14	241097	Ashtonfields Pty Ltd
15	241097	Ashtonfields Pty Ltd
1	456999	Ashtonfields Pty Ltd
2	456999	Ashtonfields Pty Ltd
1	722209	Ashtonfields Pty Ltd
1	722210	Ashtonfields Pty Ltd
10	755237	Ashtonfields Pty Ltd
18	755237	Ashtonfields Pty Ltd
19	755237	Ashtonfields Pty Ltd
20	755237	Ashtonfields Pty Ltd
23	755237	Ashtonfields Pty Ltd
29	755237	Ashtonfields Pty Ltd
31	755237	Ashtonfields Pty Ltd
37	755237	Ashtonfields Pty Ltd
38	755237	Ashtonfields Pty Ltd
39	755237	Ashtonfields Pty Ltd
223	755237	Ashtonfields Pty Ltd
36	755260	Ashtonfields Pty Ltd

Lot No.	DP No.	Landowner
35	755260	Ashtonfields Pty Ltd
34	755260	Ashtonfields Pty Ltd
48	755260	Ashtonfields Pty Ltd
30	755260	Ashtonfields Pty Ltd
29	755260	Ashtonfields Pty Ltd
28	755260	Ashtonfields Pty Ltd
27	755260	Ashtonfields Pty Ltd
26	755260	Ashtonfields Pty Ltd
43	755260	Ashtonfields Pty Ltd
25	755260	Ashtonfields Pty Ltd
24	755260	Ashtonfields Pty Ltd
23	755260	Ashtonfields Pty Ltd
22	755260	Ashtonfields Pty Ltd
45	755260	Ashtonfields Pty Ltd
46	755260	Ashtonfields Pty Ltd
1	1045719	Ashtonfields Pty Ltd
3	1045720	Ashtonfields Pty Ltd
4	1045720	Ashtonfields Pty Ltd
2	1045720	Ashtonfields Pty Ltd
1	1045720	Ashtonfields Pty Ltd
1	1045722	Ashtonfields Pty Ltd
2	1045722	Ashtonfields Pty Ltd
1	1045723	Ashtonfields Pty Ltd
11	755237	Ashtonfields Pty Ltd
44	755260	Ashtonfields Pty Ltd
35	755237	Bloomfield Group
36	755237	Bloomfield Group
10	241097	Hunter Water
4	241097	Hunter Water
5	241097	Hunter Water
6	241097	Hunter Water
1	241097	Hunter Water
2	241097	Hunter Water
3	241097	Hunter Water
7	241097	Hunter Water
8	241097	Hunter Water
9	241097	Hunter Water
1	617909	Hunter Water

Lot No.	DP No.	Landowner
1	724270	Hunter Water
1	814743	Hunter Water
102	1130948	Hunter Water
101	1130948	Hunter Water
100	1130948	Hunter Water
104	1131098	Hunter Water
105	1131098	Hunter Water
106	1131104	Hunter Water
107	1131109	Hunter Water
103	1131280	Hunter Water
120	1154927	Hunter Water
1217	1157771	Hunter Water
30	1113350	Rathvale Pty Ltd

1.4 Stakeholder Consultation

Discussions have been held with the DRG leading to the preparation of this MOP. The mining areas covered by this MOP were the subject of an Environmental Assessment (PA 07_0087) during which extensive consultation was undertaken with government authorities and the local community. This MOP has been prepared to be consistent with environmental approval documentation that formed the basis of the approval process for which the above consultation was undertaken.

Bloomfield Colliery has an established Community Consultative Committee (CCC) to provide a forum for open discussion between Bloomfield, the community (and Cessnock City Council and other stakeholders) on issues directly relating to the operation and environmental performance of the mine. The CCC comprises three representative members of the local community, Bloomfield personnel and a representative of Cessnock City Council and is scheduled to meet at least every 4 months.

Bloomfield has a Commercial Lease with the landowners, Ashtonfields Pty Ltd, which sets out post mining requirements. Stakeholder expectations and agreements with the landowner in relation to post mining land-use, rehabilitation objectives and completion criteria are outlined in detail in Sections 4 and 5.

2 Proposed Mining Activities

2.1 Project Description

The area to be mined is located in the south-western section of ML1738. Mining is currently undertaken in two pits referred to as 'S Cut' and 'Creek Cut'. Mining operations will be undertaken in both pits simultaneously.

The proposed sequence will involve mining in S Cut to advance to the north, while mining in Creek Cut advances in a southerly direction, eventually joining to create one pit. Mining in the combined pit will advance to the west and will cease with the completion of mining. The annual sequence during the MOP term is shown in Plan 3A to 3C.

Multiple seams are extracted in each cut. The coal seams worked at Bloomfield Colliery are outlined in Section 3.3.1.

A final void will remain at the end of mining. This void will be used as a reject emplacement area for the washery. The Abel Project Approval enables the washery operations to continue after the completion of mining operations at the Bloomfield Colliery.

It is proposed to mine the remaining reserves at a maximum rate of 1.3 mtpa ROM coal. Coal reserves that are currently estimated at approximately 8 million tones ROM coal within the existing approval area. The maximum annual mining rate provides for flexibility in production rates over each year to enable Bloomfield to respond to coal market fluctuations and variations in quality and yield that occur over time. A maximum annual mining rate was generally used as the basis for impact assessment studies undertaken for the EA.

The operational mine life is dependent on current development consents. The current development consent as approved under the 2017 EA (Mod 4) is valid until 31 December 2030. This MOP covers the period of mining operations from 1/7/2018 to 31/12/2020.

2.1.1 Mining Method and Equipment

Mining at Bloomfield is generally undertaken as a multi-seam truck and excavator/face shovel operation, conducted in sequential mining blocks. It is proposed to continue with these existing methods of extraction for the remaining life of the mine.

The existing mining process for each block includes:

- Vegetation removal;
- Topsoil/pre-strip;
- Drilling and blasting;
- Overburden removal and stockpiling;
- Coal removal (followed by interburden removal and coal removal for lower seams);

- Overburden reshaping and rehabilitation.

The majority of the area to be mined has previously been cleared of vegetation, with grasses and low vegetation allowed to regenerate to stabilize the surface until it is required for mining. Vegetation is pushed up into windrows with dozers for placement under advancing overburden dumps or, where practical, track rolled or chipped and included in top soil stripping operations.

Depending on topsoil/subsoil depth and quality, the material is pushed up with dozers and loaded onto haul trucks with front-end loaders, or excavated and loaded directly onto haul trucks with an excavator. It is then placed on reshaped overburden dumps in preparation for rehabilitation. Topsoil stockpiling is avoided where possible for operational and topsoil quality reasons. Lower unconsolidated (non-bedrock) horizons are free-dug as they do not require blasting prior to removal. They are then loaded onto rear dump trucks for hauling to overburden emplacements, as part of pre-strip operations.

Following topsoil/pre-strip removal, blast hole patterns are drilled into the overburden, in preparation for blasting. Blast pattern and hole depth is designed in accordance with excavator capability and safe blast design. The holes are then loaded with explosives and detonated.

After blasting, loose overburden material is removed by excavator/face shovel and placed onto rear dump haul trucks for hauling to overburden emplacements. Emplacement design will continue in a similar manner to the current operation.

The exposed coal seam is then ripped and pushed up with dozers, loaded onto trucks and transported to the ROM coal stockpile via internal haul roads. The interburden/coal extraction process is repeated for each seam until the basal Big Ben seam has been removed. The resultant void is then available for backfilling with the overburden from subsequent mining blocks. Emplacements are reshaped by dozer to create the final land contour shape.

A detailed description of the rehabilitation process is provided in Section 7. The sequence of mining showing extraction, backfilling and subsequent rehabilitation is shown in Plan 3A to 3C.

Bloomfield currently uses an excavator or face shovel and a fleet of rear dump trucks for the removal of topsoil, prestrip, overburden and interburden material. Two drill rigs are used for blast hole drilling. A coaling fleet comprising a front-end loader or excavator and rear-dump trucks used to transport the raw coal. It is proposed that the same, or similar, equipment will be used for the remaining life of the mine.

2.1.2 Coal Processing

Coal transported to the ROM stockpile is processed in the Coal Handling Preparation Plant (CHPP). All ROM coal recovered from the Bloomfield open cut is transported to the CHPP ROM pad for size reduction, washing and screening. The CHPP handles coal from the Bloomfield Colliery and holds approval to receive coal from Donaldson Coal's Abel and Tasman Extension underground mines.

The CHPP approved coal throughput is up to 8.5 mtpa ROM coal. Processed coal is then stockpiled in the CHPP product coal stockpile area. Product coal is transferred by conveyor from

the CHPP product stockpile area to the rail loading facility. The product coal is transported off-site by the rail loading facility and a dedicated rail loop which ties into the Hunter Valley rail line. Coal is transported to port facilities in Newcastle.

At the end of mining at the Bloomfield Colliery the CHPP and rail loading facility will continue to operate processing coal when available from the Abel and Tasman Extension underground mines.

2.1.3 Coarse Reject and Tailing Disposal

During the coal washing process, waste coal material is produced in solid and more liquid (slurry) form. The solid material is termed *coarse reject.* The slurry material, a mixture of fine waste and water, is termed *tailings.*

The percentage of coarse rejects and fine tailings varies depending on the source of the coal and the mining method. Based on experience at Bloomfield CHPP and other mines, the estimated average proportions of coarse rejects and fine tailings are:

- Open Cut ROM coal 21% coarse rejects, 14% fine tailings;
- Underground coal 12% coarse rejects, 8% fine tailings.

Bloomfield CHPP coarse reject is currently mixed with overburden material and placed back into open cut pits. It is proposed to continue this process, which assists in filling voids in preparation for surface rehabilitation, including revegetation.

Fine tailings generated by the washing process are pumped to the existing tailings dam facility. The existing tailings dam facility is an old open cut void and is referred to as U-Cut (Plan 2). As the fine tailings consolidate within the dam the excess water is decanted off and returned to the CHPP water storage dam for re-use.

The current tailings emplacement area (U-Cut) has approval under the Abel Project Approval. At current production levels (i.e. with Abel in care and maintenance, and Tasman Extension not yet commenced) the current emplacement area is expected to be filled during 2019. When tailings placement in the U-Cut tailings dam ceases a new tailings emplacement area will be established within the active mine void which would receive fine tailings throughout the remainder of the project. This future in pit tailings emplacement area is referred to as the S-Cut tailings facility (Plan 3C & 4).

Mining operations would move progressively north which means the lowest point of the pit floor would remain down-dip (lower in the pit) of operations, allowing mining operations to continue in isolation of tailings and decant water facilities.

The Abel Project Approval enables the washery operations to continue after the completion of mining operations at the Bloomfield Colliery.

2.2 Asset Register

In accordance with MOP Guidelines (DTIRIS-DRE, 2013) an Asset Register is provided in Table 2 that lists the domains, their size and the major assets within each domain. Table 3 also lists the principal activities required for decommissioning and rehabilitation that are costed in the Rehabilitation Cost Estimate. The domain area is representative of the disturbance footprint for that domain at the start of the MOP term.

Table 3: Asset Register

Domain	Size (Ha)	Major Assets	Decommissioning Activities During the MOP Term
Domain 1 – Infrastructure	69	• CHPP • Administration Offices • Warehouse • Workshops • Gantries • Conveyors • Hoppers • Crusher • Reclaim tunnel • ROM coal pad • Product coal pad • Sediment dams • Electricity transmission lines • Substations • Pipelines • Sealed roads • Gravel roads • Explosives magazine • Fuel farm • Carparks • Hardstand / Laydown areas	No decommissioning activities are proposed during the MOP term
Domain 2 – Tailings Storage Facility	79	• Electricity transmission line • Pipelines	Decommissioning activities are proposed to commence during the MOP term

Domain	Size (Ha)	Major Assets	Decommissioning Activities During the MOP Term
Domain 3 – Water Management Area	12	• Mine water storage dam • Process water dam • Clean water diversions • Pipelines • Electric pumps	No decommissioning activities are proposed during the MOP term
Domain 4 – Overburden Emplacement	169	N/A	N/A
Domain 5 – Open Cut / Final Void	73	N/A	N/A
Rehabilitated / Relinquished Areas	488	• Stock yards • Fencing • Stock water dams	N/A

2.3 Activities over the MOP Term

This section provides details of Bloomfield activities during the MOP term including:

- Exploration;
- Construction;
- Mining Operations;
- Rock/Overburden Emplacement;
- Processing Residues and Tailings;
- Waste Management;
- Decommissioning and Demolition Activities;
- Temporary Stabilisation;
- Progressive Rehabilitation and Completion; and
- Material Production Schedule during MOP Term

2.3.1 Exploration

No exploration activities are planned during the MOP period.

2.3.2 Construction

No construction activities are planned during the MOP period.

2.3.3 Mining Operations

The area to be mined is located in the south-western section of ML1738. Mining is currently undertaken in two pits referred to as 'S Cut' and 'Creek Cut'. Mining operations will be undertaken in both pits simultaneously.

The proposed sequence will involve mining in S Cut to advance to the west and north, while mining in Creek Cut advances in a southerly direction, eventually joining to create one pit. Mining in the combined pit will advance to the west and will cease with the completion of mining. The annual sequence is shown in Plan 3A to 3C which present the progressive development of the open cut and the overburden emplacement area for the MOP term.

The mining sequence presented in Plan 3A to 3C is based on a production rate of up to 1.3 Mtpa ROM coal production. (Table 4 presents the indicative mining and production schedule for the mine). Should the annual rate of mining and production fail to reach this level the sequence of mining will not alter, rather it will simply result in the presented development stages being reached over a longer time frame.

2.3.4 Rock / Overburden Emplacement

Waste rock mined in S Cut and Creek Cut will continue to be placed in pit behind active mining. During this MOP period waste rock will predominantly be placed against the southern and western highwalls to commence the formation of a long term stable final landform. Following blasting the overburden materials will be loaded by excavator into 180t and 220t capacity haul trucks and transported to the nominated in-pit emplacement area. Load and haul placement of the overburden material will be supplemented by throw blasting and carry dozing wherever possible.

2.3.5 Processing Residues and Tailings

The Bloomfield CHPP coarse reject is currently mixed with overburden material and placed back into open cut pits. This process will continue throughout the MOP term, which assists in filling voids in preparation for surface rehabilitation.

Fine tailings generated by the washing process are pumped to the existing tailings dam facility. The existing tailings dam facility is an old open cut void and is referred to as U-Cut (Plan 2). As the fine tailings consolidate within the dam the excess water is decanted off and returned to the CHPP water storage dam for re-use.

The current tailings emplacement area (U-Cut) has approval under the Abel Project Approval. At current production levels (i.e. with Abel in care and maintenance) the current emplacement area is expected to be filled during 2019. Bloomfield has approval from the Dam Safety Committee to raise the wall on the U Cut tailings emplacement area (a prescribed dam). However at this stage this option is not expected to proceed.

When tailings placement in the U-Cut tailings dam ceases a new tailings emplacement area will be established within the active mine void which would receive fine tailings throughout the remainder of the project. This future in pit tailings emplacement area is referred to as the S-Cut tailings facility (Plan 3C & 4).

As it is currently unknown if Abel Underground Mine would recommence operations in the future, or if Tasman Extension will commence, there are a number of variables with regard to tailings emplacement. The future tailings emplacement strategy would therefore need to be reassessed on a regular basis to consider the status of the Abel Underground Mine. The general location of the S Cut tailings area and tailings methodology are discussed in the 2017 EA (Mod 4) inside which tailings disposal could occur. This would allow the flexibility required to continue mining in the open cut pits while retaining the option to create tailings emplacement areas throughout the life of the project. The location shown in Plan 3C and Plan 4 is indicative at this stage.

During the MOP term the appropriate legislative approvals will be obtained to allow decommissioning and capping of the U Cut tailings emplacement area.

2.3.6 Waste Management

Key waste streams that will be generated during the MOP term consist of:

- Recyclable and non-recyclable general wastes; and
- Other wastes from mining and workshop activities (e.g. waste oils, oils filters, scrap metal and used tyres).

General waste minimisation principles (i.e. reduce, re-use and recycling) will continue to be applied at Bloomfield to minimise the quantity of wastes that require off-site disposal.

All general domestic waste and general recyclable products will continue to be collected by an appropriately licensed contractor. Records are maintained of waste streams collected by the licensed waste contractor for disposal.

Hydrocarbon contaminated soils will be treated on-site and tested in a land farm facility before disposal in open cut pit.

2.3.7 Decommissioning and Demolition Activities

As discussed in Section 2.1.3 and 2.3.5 the U Cut tailings facility may reach capacity during the term of this MOP. During the MOP term the appropriate legislative approvals will be obtained to allow decommissioning and capping of the U Cut tailings emplacement area.

No other infrastructure is expected to be decommissioned or demolished during the MOP period.

2.3.8 Temporary Stabilisation

No temporary stabilisation activities are proposed during the MOP period.

2.3.9 Progressive Rehabilitation and Completion

The annual sequence is shown in Plan 3A to 3C which present the progressive development of the open cut and the overburden emplacement domain for the MOP term and includes:

- Areas of completed mining and overburden emplacements;
- Land under rehabilitation; and
- Water management and control structures;

All domains will remain active throughout the term of this MOP therefore there are no new rehabilitation activities scheduled to be completed during the term of this MOP (refer to Section 7.2 for details). General rehabilitation and land management activities will also continue over previously rehabilitated areas during the MOP period, including:

- Rehabilitation monitoring;
- Supplementary seeding and fertiliser application;
- Slashing, fencing, and access control; and
- Weed and feral animal control.

2.3.10 Material Production Schedule During MOP Term

During the term of this MOP approximately 19.2 million m^3 of overburden material will be mined. Table 4 presents the anticipated development and production schedule of the mine during the term of this MOP.

Table 4: Production and Waste Schedule

Materials Production Schedule during MOP Term				
Material	**Unit**	**2018***	**2019**	**2020**
Stripped Topsoil	m^3	30,000	100,000	-
Overburden	m^3	6,400,000	6,400,000	6,400,000
ROM Coal	tonnes	1,200,000	1,100,000	1,300,000
Processing Waste**	tonnes	600,000	500,000	600,000
Product	tonnes	600,000	600,000	700,000

* Full calendar year.

** Abel mine currently under care and maintenance, Tasman Extension not yet operational. Processing waste figure may increase if Abel / Tasman Extension operations resume / commence during MOP period.

3 Environmental Issues Management

3.1 Risk Assessment

An Environmental Risk Assessment (ERA) was conducted to evaluate the environmental issues associated with the mining operations. The aim of the ERA is to identify and present effective management protocols for environmental risks associated with the mining operations.

The following specific aims and objectives have been established for this ERA:

- To identify the activities, aspects and possible environmental impacts associated with the operation;
- To consider these activities in isolation of any controls and determine a potential raw risk rating;
- To identify the current controls (that are already in place) to mitigate or minimise the potential for the impacts in order to reduce the risk to as low as reasonably practicable;
- To identify potential future controls that may assist to either eliminate or mitigate other likely impacts;
- Determine the residual risk and ensure that is it appropriately low enough given the sensitivities of the project location. This was undertaken following consideration of the controls/mitigation strategies already in place and others that may be proposed.

3.1.1 Determination of Environmental Risk Rating

Environmental Consequences

The allocation of an Environmental Risk Rating was based on the Consequence descriptions contained in Table 5. The magnitude of the consequence of an event was assessed using these descriptors and assigned a Rating of 1 to 5.

Table 5: Environmental Consequences Description

1	Catastrophic	A major event which could cause severe or irreversible damage to the natural and/or human environment.
2	Major	An event which could have a substantial and permanent consequence to the natural and / or human environment.
3	Moderate	An event which could create substantial temporary or minor permanent damage to the natural and / or human environment.
4	Minor	An event which could have temporary and minor effects to the natural and / or human environment.
5	Insignificant	No detrimental impact on the natural and / or human environment is measured or envisaged.

Probability of an Incident Occurring

The likelihood of an event occurring was considered in the ERA. The likelihood (or probability) of an impact occurring was rated according to the following descriptions on Table 6.

Table 6: Qualitative Measures of Likelihood (Probability)

PROBABILITY	
A	Almost certain to happen
B	Likely to happen at some point
C	Moderate: possible, heard of so it might happen
D	Unlikely: not likely to happen
E	Rare: practically impossible

Environmental Risk Matrix

The Risk Rating was assigned by combining the consequence with the probability that the consequence would occur. A numerical Risk Ranking between 1 and 25 was allocated for each aspect of the proposal using the "*Environmental Risk Matrix*" included as Table 7 below.

Table 7: Environmental Risk Rating Matrix

Maximum Reasonable Consequence	Probability A	B	C	D	E
1	1	2	4	7	11
2	3	5	8	12	16
3	6	9	13	17	20
4	10	14	18	21	23
5	15	19	22	24	25

Risk Classification System

Depending on the numerical Risk Ranking, a Risk Rating Class was then applied to each aspect using the Risk Classification System. Table 8 shows the different classes of the Risk Classification System.

Table 8: Risk Classification System

Risk Classification System	
High Risk (H)	1 to 6 (Red)
Medium Risk (M)	7 to 15 (Yellow)
Low Risk (L)	16 to 25 (Green)

In accordance with this Risk Classification System, one of the following Environmental Risk Ratings was assigned to each aspect:

- **H (high)** being a *Class 1 Risk* - requires immediate management attention, a stop/stand down until rectified if deemed necessary.
- **M (moderate)** being a *Class 2 Risk* - acceptable with current controls but requires attention if controls absent or ineffective, and where practicable develop other controls to mitigate the risk.
- **L (low)** being a *Class 3 Risk* – acceptable risks are assessed and controlled as required.

3.1.2 Environmental Risk Prevention Measures

A Risk Register to document the risk assessment outcomes for all aspects identified throughout the ERA process is provided in Appendix 2. The key Aspects included in the Risk Register are typical of an open cut mine of this nature and are summarised below:

- Disturbance of Aboriginal Heritage
- Disturbance of European Heritage
- Erosion and sedimentation
- Fire Hazard
- Dust
- Noise
- Contamination of surface and ground water resources
- Storage and management and hydrocarbons including spills and leaks
- Introduction of weeds.

3.2 Environmental Risk Management

An environmental management system has been established which includes implementation of environmental management commitments contained within a number of management plans and strategies which have been prepared in accordance with relevant approval conditions. The environmental management plans, strategies and programs required at Bloomfield are:

- Environmental Management Strategy (EMS);
- Noise Monitoring Plan (NMP);
- Aboriginal Cultural Heritage Management Plan (ACHMP);
- Air Quality Monitoring Program (AQMP);
- Blast Monitoring Program (BMP);
- Water Management Plan (WMP) incorporating:
  - Site Water Balance;
  - Erosion and Sediment Control Plan;
  - Surface Water Monitoring Plan; and
  - Groundwater Monitoring Program;
- Landscape Management Plan (LMP);
- Rehabilitation Management Plan (RMP);
- Final Void Management Plan (FVMP):
- Mine Closure Plan (MCP);
- Biodiversity Offset Management Plan (BOMP); and
- Energy Savings Action Plan.

These plans are available on the Bloomfield Group website (http://www.bloomcoll.com.au).

3.3 Specific Risks Relating to Rehabilitation

3.3.1 Geology and Geochemistry

The coal bearing stratum occurring in the Project Area are the Tomago Coal Measures. These coal measures lie beneath the Newcastle Coal Measures and above the Maitland Group. The coal seams worked by Bloomfield Colliery, in descending order, are as follows:

- Buttai Seams (E and F Seams);
- A, B, and C Seams;
- Whites Creek Seam;
- Elwells Creek Seam;
- Donaldson Seam;
- Big Ben Seam; and
- Rathluba Seam.

Seams present as either complete seams, a number of splits of the seam, or a collection of dispersed coal bands. The Rathluba Seam is not proposed to be mined in the current mine plans.

Site geology is typified by moderately dipping strata from the eastern and western sides of the lease, forming a syncline running axially from the north-east to the south-west of the lease. There is a well-defined dyke and fault structure running from the north-north-west to south-south-east through areas where mining has been completed through both open cut and underground methods. The remaining coal reserves have no known major geological impediments.

3.3.2 Material Prone to Spontaneous Combustion

Experience in the stockpiling of coal Bloomfield Colliery indicates that stored coal is not susceptible to spontaneous combustion. However, the following safeguards, controls and management measures will continue to be implemented:

- Minimising the length of time coal is held in stockpiles.
- Monitoring coal stockpiles for signs of spontaneous combustion.
- Immediately reporting incidents.
- Extinguishment by excavation, spreading and saturation with water.

Spontaneous combustion from carbonaceous material in coarse rejects produced by the CHPP is managed by incorporating the rejects with overburden prior to burying. The management measures include:

- Potential spontaneous combustion material will be placed in thin layers, only in the designated active emplacements, and to be rapidly buried with inert cover of at least 5 metre depth;

- Regular inspections of disposal areas, to identify and monitor indicators of spontaneous combustion, including surface cracking, visible smoke, and carbonaceous combustion odour;
- Corrective actions, should significant spontaneous combustion be identified; and
- Reporting of area of active spontaneous combustion in the AEMR.
- Material to be placed in low dumps, at the toe of progressing dump to provide compaction.

3.3.3 Material Prone to Generating Acid Mine Drainage

Historically, there has been no evidence of acid production on the site. As such, the potential for acid rock drainage problems arising from the waste rock emplacements is considered to be low. Because of this analytical tests have not been conducted in the past. However, to better assess the risk associated with acid production, analysis of waste rock and coarse rejects will be carried out and reported in the Annual Review.

3.3.4 Mine Subsidence

Mine subsidence can occur because of the amount of ground disturbance that occurs adjacent to a mine – particularly an underground mine. This MOP addresses specifically the issues relating to the open cut mine where the prevalence of ground subsidence is typically limited to the settlement of waste emplacement areas.

Areas of the Bloomfield mine site are undermined by historic underground workings. Sink holes associated with shallow workings are infrequent and if occur are located in the rehabilitated areas on the western side of the Mining Lease. If identified, the standard management procedure is to flag off and isolate the sink holes from access, back fill the holes and monitor for further subsidence. Once deemed stable, the area will then be rehabilitated and periodic inspections will continue.

During the term of the MOP staff will monitor the settlement of the waste emplacement areas for signs of uneven or excessive displacement that may alter drainage patterns or present a safety risk. If excessive displacement is identified then repair works will be carried out.

3.3.5 Erosion and Sediment Control

Erosion and sedimentation at Bloomfield is controlled under the *Water Management Plan* (WMP), which includes an *Erosion and Sediment Control Plan* (ESCP).

Prior to the disturbance of land associated with any mining activities at the site, appropriate erosion and sediment controls are established. Where practicable, runoff from undisturbed catchments is diverted around the mining activities via diversion drains and banks which direct water into the natural watercourses. Runoff from disturbed areas is retained on site in sediment dams and allowed to settle prior to discharge into the natural system. Drains, diversion banks and channels are compacted and stabilised as they are constructed.

General measures in place to minimise erosion and sediment mobilisation during operation include:

- Installing erosion and sediment controls prior to the disturbance of any land;
- Minimising the extent of disturbance to the extent that is practical;
- Reducing the rate of water flow across the ground particularly on exposed surfaces and in areas where water concentrates;
- Progressively rehabilitating disturbed land and constructing drainage controls to improve stability of rehabilitated land;
- Ripping of rehabilitation areas to promote infiltration;
- Protecting natural drainage lines and watercourses by constructing erosion control devices which include sediment retention dams and diversion banks and channels; and
- Restricting access to rehabilitated areas.
- Maintenance of erosion and sediment control structures

Erosion control on reshaped and rehabilitated areas is achieved by minimising the time prior to establishing vegetation. Suitable drainage densities are established with sediment detention basins being constructed in the flow lines. Sediment detention basins are also used along haul roads and around areas of disturbance; these structures are de-silted as necessary.

3.3.6 Soil Types and Suitability

Topsoil Management

The activities of stripping and stockpiling of soil resources prior to any mine-related disturbance will be undertaken in accordance with the soil resource management activities described in Table 9. These activities aim to:

- Optimise the recovery of topsoil and subsoil available for rehabilitation;
- Manage topsoil and subsoil reserves so as not to degrade the resource;
- Determine the suitability and stripping depth of soil material to be removed; and
- Ensure that the reuse of suitable soils is maximised.

A topsoil balance will be calculated annually and reported in the Annual Review. This will enable an assessment to be made of the top soil volume available for rehabilitation.

Table 9: Soil Resource Management Activities

Prior to Commencement of Stripping Activities	**During Stripping and Stockpiling Activities**	**Prior to and During Rehabilitation Activities**
- Quantify the soil resource. - Characterise the suitability of material for rehabilitation purposes. - Formulate stripping and stockpiling guidelines specific to each activity. - Guidelines are to include: • Nomination of appropriate depths. • Scheduling to minimise the total area disturbed or stockpiled at any one time. • Location of areas to be stripped and stockpile locations.	- Minimise over-clearing. - Keep vehicular traffic to a minimum on the soils to be stripped. Exclude all traffic from soils that are sensitive to structural degradation. - Use of loaders and trucks rather than scrapers to minimise structural degradation. - Selective stockpiling of soil according to type (i.e. topsoil, subsoil). - Storage of soil in a manner that does not compromise the long term viability of the resource. - Weed management to prevent germination/succession of exotic species.	- Implement amelioration measures to ensure the long term viability of the soil resource and manage salinity. - Progressive rehabilitation of final landforms as soon as practicable after completion of mine-related disturbance activities.

Soil Stockpile Management

The following soil stockpile management practices will be used to increase the long term viability of the soil resources in stockpiles:

- Topsoil stockpiles are to be located outside of proposed mining areas and away from slopes and drainage lines where possible;
- Stockpiles will be constructed with a “rough” surface condition to reduce the risk of erosion, improve drainage and promote revegetation;
- Topsoil stockpiles will be no deeper than three metres in order to minimise problems with anaerobic conditions;
- Fertilise and seed stockpiles to maintain soil structure, organic matter and microbial activity, whilst areas which are to be inactive for extended periods may be seeded with the final species mix;
- Stockpiles will be located to prevent runoff leaving the site;

- The appropriate soil ameliorant be applied at an appropriate rate to dispersive soil stockpiles where necessary; and
- Implement appropriate weed control strategies particularly for any noxious weeds. Immediate revegetation will provide vegetative competition to assist with control of undesirable plant species.

Soil Ameliorants

Soils throughout the project area are generally low in organic matter and nutrients suitable for the establishment of pastures and overstorey species. These factors reduce the availability of nutrients and may create an unfavourable microclimate for germination of plant seeds. The key management practices to rectify these issues are:

- Application of the appropriate amount of soil ameliorant and fertiliser;
- The establishment of a cover crop for soil protection purposes and improvement in organic matter levels; and
- Use of imported organic materials such as bio-solids, mulch, organic growth media (OGM) and municipal waste compost.

3.3.7 Flora and Fauna

Flora and fauna surveys were carried out over the future mining areas as part the Environmental Assessment process and the subsequent Project Approval modification. One of the vegetation communities identified, the *Lower Hunter Spotted Gum – Ironbark Forest*, is listed as an Endangered Ecological Community in the Biodiversity Conservation Act 2016. A total 123 native plant species were recorded with no threatened flora species identified. A total of 73 native vertebrate fauna species were recorded of which 6 species identified are listed as Vulnerable under the BC Act. The 6 consisted of 1 bird species and 5 bat species.

Bloomfield has put in place many measures to minimise impacts on flora and fauna on the site including the following:

- Implement the Rehabilitation Management Plan for the mine site.
- Clearly define all approved areas to be cleared.
- Undertake progressive rehabilitation of all disturbed areas.
- Control noxious weeds.
- Adopt a strategy to rehabilitate specific areas of the mine site to native vegetation;
- Conserve the existing native vegetation in non-mining area of the mine site during the life of the project and in the final landform.
- In areas where tree clearing is approved, carry out, where possible, tree removal, especially the mature trees in late spring and early autumn to avoid spring nesting birds and disturbance to roosting bats over the winter period.
- Undertake inspections of mature trees for nesting birds and roosting bats prior to each clearing campaign where mature tree with hollows are to be removed.

- Relocate any nesting and roosting hollows, as well as nests, used by listed threatened species to appropriate locations nearby.
- Establishment of a 40 Ha Biodiversity Offset Area to compensate for the loss of vegetation.

Weeds and Pests

Weed management at Bloomfield is controlled under the *Weed Management Plan.* Appropriate noxious weed control methods and programs are being undertaken in consultation with the local council weeds control officers. This program of inspection and eradication will continue as part of the post-mine ongoing maintenance program. The weed management will be required for the life of the project to ensure that no lasting legacy is left at the completion of operations at Bloomfield Colliery.

The mine site will be regularly inspected for weeds, particularly areas being revegetated, as part of a monitoring program aimed at assessing the success of rehabilitation. Additional monitoring or eradication will be undertaken at the request of weeds inspectors of Local Councils. The results of all monitoring will be included in the relevant Annual Review.

Periodic feral animal control programs have been undertaken in conjunction with neighboring mines. Activities have included wild dog baiting programs. These programs will continue in future on an as need basis.

3.3.8 Air Quality

Bloomfield has put in place many measures to control dust around the site including the following:

- Dust generating activities will be temporarily ceased when protracted dry periods and/or high winds lead to significant dust generation and dispersal towards the surrounding residences.
- Where practicable, soil stripping will be undertaken at a time when there is sufficient soil moisture to prevent significant lift-off of dust.
- Bloomfield will avoid stripping soil in periods of high winds.
- The drill rig will utilise water injection or alternatively, be fitted with dust collectors.
- Blast hole stemming will be used to prevent venting of explosion gases.
- Blasting will be conducted only after low-level atmospheric temperature inversions have dissipated.
- Ripping of softer overburden material will be avoided during periods of high wind.
- Avoiding directing the placement of overburden into high emplacement dumps during periods of high wind.
- All conveyors will be fitted with appropriate cleaning and collection devices to minimise the amount of material falling from the return conveyor belts.
- Clear definition of any access or haul roads and the restriction of vehicles and equipment to those roads.
- Routine application of water with or without chemical dust suppressants.

- Progressive rehabilitation of areas of disturbance including topsoil and subsoil stockpiles.
- Internal haul roads will be regularly watered. The frequency of water application to the various internal haul roads and exposed surfaces will be dependent on climatic factors.
- Limit vehicle speeds.
- The use of a predictive meteorological modeling software program is utilised to assist in planning mine operations. The software incorporates regional weather station data to predict daily weather events that may exacerbate dust impacts from operations.

Dust monitoring is carried out in accordance with the Air Quality Monitoring Program (AQMP). The dust monitoring program in place comprises:

- 10 dust deposition gauges located on and around the mine lease area;
- 2 High Volume Air Samplers (HVOL); and
- 2 Dustrak units located upwind and downwind of the mining area.

Results of the monitoring program are reported in the AEMR.

3.3.9 Surface Water

Surface water is managed in accordance with the Water Management Plan (WMP). The Plan prescribes the process water source and supply requirements, site-water balance, storage, impact management and monitoring of surface water in the vicinity of the mining operations. The water management system has been designed with three primary goals and objectives:

- Separation of clean water and mine water;
- Safe storage and priority use of mine water on-site;
- Management of water that is discharged so as to preserve the environmental values of Four Mile Creek and comply with the conditions of EPL 396.

Water quality data from surface water quality monitoring points at Bloomfield are documented in the Annual Review available on the website. In meeting the water management objectives, the following components of the system have been constructed or implemented.

Mine Water

Bloomfield has two major mine water storage facilities referred to as Lake Kennerson and Lake Foster. Water pumped from the open cuts (S Cut and Creek Cut) reports via open drains to Lake Kennerson. Run off from disturbed areas (i.e. high wall, haul roads, overburden dumps awaiting rehabilitation) which has the potential to carry suspended solids, is also directed to Lake Kennerson.

Lake Kennerson has a valve controlled pipe which, when opened, feeds to Lake Foster. Lake Foster also receives decant water from the tailings storage facility and water from sediment dams which collects the runoff from the CHPP and coal stockpile pads. Mine water is pumped, primarily from Lake Foster, to the CHPP for use in coal processing and for dust suppression spraying on the coal stockpile pads.

Mine water is discharged, via lockable valve pipes, into an open drain that flows to Four Mile Creek. Discharges are undertaken in accordance with conditions of the Environmental Protection Licence (EPL 396). Water samples are collected during discharge for independent water quality analysis. A monitoring station located downstream in Four Mile Creek continuously measures electrical conductivity (EC) and water level. Monthly background sampling is conducted in Lake Kennerson, Lake Foster and various upstream and downstream watercourses.

Clean Water

Run off from undisturbed and rehabilitated areas is directed away from operational areas and mine water storages via diversion banks and channels. These banks and channels direct this run off into clean water dams or natural watercourses. The major clean water storage dam is Possums Puddle. No clean water is accessed for operational purposes and these dams overflow into natural drainage systems. Further isolation of smaller rehabilitated catchment areas from the mine water system will continue as rehabilitation work progresses.

The major natural creek running through the site is Four Mile Creek. Most of the operational mining areas at Bloomfield are located within the catchment of Four Mile Creek. A series of drains and levees direct Four Mile Creek around Lake Foster (mine water storage) and into Possums Puddle (clean water storage). From Possums Puddle clean water overflows back into Four Mile Creek.

3.3.10 Groundwater

Groundwater is managed in accordance with the Water Management Plan (WMP). The Plan prescribes the process water source and supply requirements, site-water balance, storage, impact management and monitoring of groundwater in the vicinity of the mining operations.

The groundwater monitoring plan identifies locations and schedule for monitoring. The objectives of ongoing groundwater monitoring are to identify potential physical and/or chemical water quality impacts, identify and confirm trends.

Groundwater monitoring results are documented in the Annual Review available on the Bloomfield website.

3.3.11 Contaminated Land

No contaminated or polluted land has been identified and as such no specific management controls or monitoring procedures are required.

3.3.12 Blasting

Particular attention is applied in all areas of drill and blast from design through to initiation towards minimising disruption to the environment through reduction of blast overpressure, dust generation and vibration. Management controls include the following.

- Ensure all blasts are designed to comply with blast limits specified in the Environment Protection Licence.
- Blast design and implementation will be undertaken by a suitably qualified blasting engineer and/or experienced and appropriately certified shot-firer.
- The blast face, where practical, will be oriented away from or at an oblique angle to nearby residences.
- Blast hole spacing will be implemented in accordance with blast design.
- Appropriate burden distance and stemming length will be selected and then implemented precisely.
- Appropriate materials for stemming will be used, eg. 20mm aggregates.
- The use of predictive meteorological modeling software is utilised to plan blasting operations.

Blast monitoring is carried in accordance with the Blast Monitoring Program (BMP) prepared for the mine. A network of 4 blast monitors is utilized to monitor the impacts of blasting. All blasts and resultant dust plume are video recorded. Blast monitoring results are documented in the Annual Review available on the Bloomfield website.

3.3.13 Noise

The following safeguards, controls and management measures will continue to be implemented:

- Construct the out-of-pit overburden emplacement to provide an acoustic barrier between the open cut and non-project-related residences.
- In adverse conditions placement of overburden on the out-of-pit emplacements will be avoided as far as practicable during night-time operations.
- Confine operations to lower levels of the in-pit overburden emplacement to mitigate noise exceedances under adverse wind conditions, ie. avoid operations on elevated section of the overburden emplacements during inversions and N and NW winds.
- All equipment used on site will be regularly serviced to ensure the sound power levels remain at or below the levels used in the modelling to assess generated noise levels and compliance with the criteria.
- Cladding has been fitted surrounding the washery to reduce noise levels generated by the washery.
- Mid-high frequency broadband reverse beepers are fitted to mobile mining equipment, decreasing sound power levels by 2 dB(A) to 3 dB(A).

- The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads.
- Maintain dialogue with neighbours and local community to ensure any concerns over operational or transport noise are addressed.
- The use of predictive meteorological modeling software is utilised to plan daily operations.

Monitoring will continue to be undertaken in accordance with an approved Noise Monitoring Program (NMP). Attended and unattended quarterly noise monitoring is undertaken to assess noise impacts against relevant criteria detailed within the Development Consent at five monitoring locations. The Noise Monitoring Program also includes a Noise Monitoring Protocol which provides detail of the steps to be taken in the event of noise complaint or non-compliant monitoring results.

3.3.14 Visual and Lighting

The following controls are being implemented by Bloomfield:

- A buffer zone of native bush land is maintained around the site to screen mining and processing operations.
- Progressive rehabilitation of all disturbed areas within the mine site will continue to be undertaken. Ongoing rehabilitation by Bloomfield Colliery will improve the visual quality for residences with a view of the current mining operations, especially to the south of the mining area.
- Priority will be given to the completion of rehabilitation along the southern boundary of the site. This would reduce any potential visual impact, especially for residents in the Buttai Valley and users of John Renshaw Drive.
- Lighting impacts should be kept to the minimum necessary for operational and safety needs. Where possible, lights should be utilised at the lowest effective level and directed away from incoming views, in particular, Buttai Valley, John Renshaw Drive and Ashtonfield.
- All lighting should be directed to the ground and to within the work area and avoid being cast skyward or over long distances.
- Procedures are in place to ensure lighting does not shine directly toward residences in any direction. Staff and management will continue to be trained in the management of night lighting.

3.3.15 Heritage (Aboriginal and European)

Aboriginal and cultural heritage at the site is managed under the approved Aboriginal Cultural Heritage Management Plan (ACHMP). This document sets out the procedures for the protection of Aboriginal sites as well as the salvage and care of Aboriginal objects found within the operational activities. Additional objectives of the Plan are to:

- To establish an ongoing Aboriginal stakeholder consultation process;
- To describe the manner in which certain Aboriginal sites will be salvaged;
- the importance of ongoing consultation with Aboriginal stakeholders during mining; and
- To describe a program for Aboriginal site survey and assessment in areas not addressed by the original EA.

No items of European Heritage are present within the operational areas.

3.3.16 Bushfire

Bloomfield has implemented a number of measures and safeguards to minimise bushfire risk which include:

- Fitting fire extinguishers to all earthmoving and mining equipment;
- Maintaining fire trails and access roads within the lease area and on Bloomfield and Ashtonfield Pty Ltd owned land, which serve as access for firefighting services as well as establishing a fire break;
- Regular slashing of boundary fences of the lease area and on Bloomfield and Ashtonfield Pty Ltd owned land which serve as establishing a fire break;
- Regular slashing of Bloomfield owned grazing properties surrounding the lease area to reduce potential grass fire fuel loads;
- Regular contact with Rural Fire Service to assess fuel loads in native bushland surrounding and within the mining operational areas and undertaking hazard reduction burns as deemed necessary;
- On-site water carts with fire fighting capabilities.

4 Post Mining Land Use

4.1 Regulatory Requirements

The regulatory requirements specific to post mining land use and rehabilitation outcomes at Bloomfield are summarised in Table 10.

Table 10: Regulatory Requirements

Section / Condition	Area	Requirement
PA 07_0087		
Schedule 3 Condition 25	ML 1738	The proponent must rehabilitate the site to the satisfaction of DRG and the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the documents in condition 2 of Schedule 2 and comply with the objectives in Table 5 of PA 07_0087 (Mod 4).
Schedule 3 Condition 25A	ML 1738	The Proponent must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.
Schedule 3 Condition 26	ML 1738	The proponent must prepare a detailed Landscape Management Plan for the project to the satisfaction of the Secretary and DRG. This plan must include a:
Schedule 3 Condition 27	Rehabilitation Areas	Rehabilitation Management Plan
Schedule 3 Condition 28	Final Void	Final Void Management Plan
Schedule 3 Condition 29	ML 1738	Mine Closure Plan
ML 1738		
Condition 2	ML 1738	Any disturbance as a result of activities under this mining lease must be rehabilitated to the satisfaction of the Minister.

Section / Condition	Area	Requirement
AMA1001		
Schedule Condition 1	AMA1001	The leaseholder must rehabilitate the land described in Schedule C that is or may be affected by the carrying out of the ancillary mining activities
CCL761		
Condition 2	CCL761	Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the Director-General.

4.1.1 Four Mile Creek Rehabilitation and Closure Plan (2004)

Bloomfield has entered into a commercial lease agreement with the majority landowner, Ashtonfields Pty Ltd, with regards to rehabilitation obligations for disturbed land at Bloomfield. In the document, Bloomfield Mine is referred to as 'Four Mile Creek Mine'. The agreement sets out general obligations such as the requirement to provide a safe and stable landform. It also sets out specific criteria for the removal of infrastructure and the rehabilitation of overburden dumps, roads, final voids, dams and tailings emplacements. Henceforth, the plan is referred to as the 'Ashtonfield Agreement'.

4.2 Post Mining Land Use Goal

4.2.1 Factors Influencing Post-Mining Landform and Land Uses

A range of final land uses for the Project Area have previously been considered by Bloomfield and the landowner. Selection of an appropriate post-mining land use and development of a suitable post mining landform is discussed in the 2017 EA (Mod 4) and is an integral part of this MOP. Factors influencing the selection of an appropriate post-mining landform and land use are:

- DRG requirements with regard to landform stability and safety;
- The Hunter Regional Plan 2036 (DP&E, 2016) a 20 year blueprint for the future of the Hunter region. The vision is to create a leading regional economy in Australia with a biodiversity-rich natural environment, thriving communities and greater housing choice and jobs. Therefore any decisions regarding the post-mining landform and land use would need to take this, and any additional detailed plans that may be prepared in the future, into consideration;

- The majority of the mining lease area is owned by Ashtonfields and any decision regarding post mining landform and land use will take the obligations under the commercial lease agreement between Bloomfield and Ashtonfields '(Ashtonfield Agreement') into consideration (Refer Section 4.1.1);
- The Stony Pinch Consortium has been established by the major landowners of the site and surrounds to act as a coordinated and single entity in the planning and development of the overall site. The consortium includes Bloomfield, Ashtonfields, and Yancoal to develop the large combined landholdings of the member companies post mining. A legal agreement between the landowners ensures that individual landowner interests in the site are replaced by a single, shared interest in all land use and development outcomes. As outlined in the 2017 EA (Mod 4), an indicative final land use plan has been developed and the plan has been issued to Council and regulatory authorities for consideration; and
- The Bloomfield CHPP, rail loading facility and associated infrastructure will continue to operate after the mining as currently approved is scheduled to be completed, so active CHPP infrastructure and transport will continue in the mining lease area.

4.2.2 Consideration of Alternative Final Landforms and Uses

4.2.2.1 Alternative Final Landforms

The final landform incorporates a final void on the Colliery site to be used as a tailings facility for the ongoing operations at Abel Underground Mine. With the Abel Underground Mine currently in care and maintenance, the final landform presented as part of this MOP would depend on whether the Abel Underground Mine resumes operations. Therefore final landform designs have been prepared for two scenarios:

- One which assumes Abel Underground Mine resumes operations; and
- A second scenario which assumes the Abel Underground Mine remains in care and maintenance.

The indicative final landform for both of these scenarios is shown in Plan 4A and Plan 4B.

A range of alternative final landforms for the mine site area have been considered by Bloomfield and are detailed in the 2017 EA (Mod 4). The following options have been considered in the development of the proposed mine plan and subsequent final landform:

- Option 1 – Existing approved final landform (as per 2008 EA);
- Option 2 – No final void;
- Option 3 – The large void plan; and
- Option 4 – The flat area plan.

Each of these options are discussed further in the 2017 EA (Mod 4). Below is a summary of Option 4 which is the preferred option as assessed in the 2017 EA (Mod 4). The indicative final landform for Option 4 is shown in Plan 4A.

Option 4 is characterised by a large flat area and also features two voids within the combined S Cut and Creek Cut. These include a smaller temporary void to the south which would be used for tailings emplacement from the Abel Underground Mine (if required) and a larger final void to the north, with an associated reduction in the slopes of the final landform. In the event that Abel Underground Mine does not reopen, the temporary void to the south would be filled and the final void to the north would be slightly larger.

Under Option 4, the higher dump footprint is minimised compared to Option 3. Another benefit of Option 4 is that it doesn't contain highwalls, which reduces public safety and stability risks. Also importantly this option has the smallest final depression when compared to Option 1 and Option 3.

The extent of higher elevation land in the Option 4 final landform is reduced compared to that of Option 3, which would lessen the visual impact for surrounding landholders. The slope of the final landform is not as steep as that of Option 3 and is more suitable for inclusion into the development plans for the final land use (refer to Section 4.2.2.2). The landforms would be stabilised and sown to pasture to ensure a continuing stable landform and post mining grazing would allow consolidation of the landforms.

4.2.2.2 Alternative Final Land Uses

Alternative final land uses considered in the 2008 EA include residential, industrial, open forest / bushland or undulating grazing land / rural landscape. Details of these alternatives, with respect to the considerations presented in Section 4.2.1, are provided as follows.

Residential Land Use

The current zoning of the Project Area is 1(a) Rural 'A', and as such no residential or rural residential development is currently permissible. There are no regional or local plans that currently identify the area as being required for residential land use. The Hunter Regional Plan 2036 does not identify the mine site for future residential development. As the Hunter Regional Plan 2036 is progressed, residential development may be included in those parts of the mine site identified as reaching satisfactory safety and stability criteria associated with such development.

Industrial Land Use

The site and surrounding area has previously been identified as having potential for industrial-type uses in the future. Bloomfield consider that the mine site area should be rehabilitated in such a way that does not conflict with this future land use. Such rehabilitation would mean providing a

flat to undulating topography suitable for mixed use industrial, seeded with grasses to stabilise, together with areas of trees for habitat, until such time as detailed determinations are made regarding any future industrial use of the site. Should no such future development eventuate, the site would remain as a stable, rural landscape.

Open Forest / Bushland

Previously mined areas adjacent to and parts of the current active areas have been rehabilitated to grazing land with areas of native vegetation. Due to visibility of parts of the Bloomfield site from outside areas and the proximity of bushland to the west and east and the desire to provide ongoing habitat opportunities for fauna, Bloomfield consider it important to incorporate areas of bushland into its rehabilitation plans.

As the Stony Pinch Consortium identifies the mine site areas as part of a future residential / industrial development, Bloomfield considers that areas of tree seeding identified in rehabilitation plans be carefully selected, considering any future development plans.

Undulating Grazing Land / Rural Landscape

This option would rehabilitate the mine site area to undulating grazing landform consistent with its pre-mining land capability, while still providing areas of native vegetation to enhance biodiversity and aesthetic values. This option provides local habitat opportunities and linkages with adjacent remnant native vegetation. This land use type allows Bloomfield to progressively rehabilitate the mine site area to a stable landform that minimises erosion and sedimentation.

4.2.3 Preferred Post-Mining Landform and Final Landuse

As discussed in Section 4.2.2.1, Option 4 is the preferred post-mining landform. The indicative final landform for Option 4 is shown in Plan 4A. Option 4 was considered to be the best option as it achieves the following:

- Allows Bloomfield to offer continued employment on the site and to service existing contracts and provides the economic and flow on benefits to the local community by developing the remaining coal reserves (as opposed to Option 1);
- A resulting landform which offers the best shape and slope for post mining commercial utilisation by the land owner;
- Removal of highwalls from the final landform which reduces the public safety risk; and
- Reduction in the extent of higher elevation land which reduces the visual impact for surrounding landholders.

After consideration the land use options discussed in Section 4.2.2.2 and the requirements under the Lease Agreement with Ashtonfields Pty Ltd, Bloomfield has determined that rehabilitated land suitable for a variety of future land uses, whilst enabling the retention of habitat areas, is the most

appropriate choice. As the site and surrounding area has been identified as having potential for industrial-type uses in the future, Bloomfield consider that the mine site area should be rehabilitated in such a way that does not conflict with this future land use. Such rehabilitation would mean providing a flat to undulating topography suitable for mixed use industrial, seeded with grasses to stabilise, together with areas of trees for habitat, until such time as detailed determinations are made regarding any future industrial use of the site. Should no such future development eventuate, the site would remain as a stable, rural landscape.

The mine site area is therefore proposed to be rehabilitated in accordance with its pre mining land capability to create a stable, undulating landscape with a mix of pasture and tree areas suitable for grazing and general habitat.

4.3 Project Rehabilitation Objectives

The current aim of rehabilitation at Bloomfield Colliery is to provide a safe and stable landform, compatible with the surrounding landscape, which allows for a range of possible post-mining land-uses including mixed-use development as stated in Section 4.2.3 above.

4.3.1 General Rehabilitation Objectives

- Land will be rehabilitated in accordance with relevant DRE standards applicable at the time of rehabilitation;
- Rehabilitated land will represent a minimal source of off-site environmental impacts, such as dust, water pollution, visual amenity and weeds;
- All infrastructure owned by Bloomfield Colliery must be removed under the terms of its Commercial Lease with the landowner (Ashtonfields). Remaining infrastructure subject to appropriate appovals;
- Rehabilitated land will require ongoing management inputs no greater than similar adjacent land; and
- Rehabilitation will be compatible with the proposed post-mining land-use (mixed-used development).

4.3.2 Landform Objectives

- Rehabilitated land will be safe and stable;
- Land capability will be returned to a class similar to that existing prior to the commencement of mining; and

- Mined land will be re-contoured to a landform compatible with the surrounding natural landscape.

4.3.3 Vegetation Objectives

- Rehabilitated land will be topdressed, fertilised and sown with grass seed and/or native vegetation species; and
- A sustainable vegetation cover will be established on rehabilitated land.

5 Rehabilitation Planning

5.1 Domain Selection

In accordance with the ESG3 Mining Operations Plan (MOP) Guidelines, the primary domains have been defined on the premise of land management units within the mine site, usually with unique operational and functional purpose and therefore similar geophysical characteristics. Secondary Domains are defined as land management units characterised by a similar post mining land use objective.

The primary and secondary domains are to the defined together with the codes which have been allocated for each domain as shown in Table 11.

The purpose of this MOP is to focus on all mine disturbed land and the associated rehabilitation, accordingly unmined lands which form part of the Mining Lease and are not directly impacted have not been included as domain.

Table 11: Primary and Secondary Domains

Primary Domain		Secondary Domain	
1	Infrastructure Area	A	Final Void
2	Tailings Storage Area	B	Water Management Area
3	Water Management Area	C	Rehabilitated Area - Pasture
4	Overburden Emplacement	D	Rehabilitated Area - Trees over Pasture
5	Active Mining Area	E	Infrastructure
		F	Relinquished Lands

Plans 2, 3A, 3B and 3C show the domains relevant to Bloomfield. Plan 4A and 4B shows the proposed final landform and post-mining land use secondary domains.

5.2 Domain Rehabilitation Objectives

General rehabilitation objectives are outlined in Section 4. The rehabilitation objectives for each mine domain are presented in Table 12.

Table 12: Domain Rehabilitation Objectives

Code	Domain Name	Rehabilitation Objectives
1	Infrastructure Areas	Where not required in the Ashtonfield Agreement, all buildings, fixed plant and powerlines will be demolished and removed from the site. Under the Ashtonfield Agreement designated roads will be left in a maintained condition at the end of operations suitable for 2WD or 4WD dry weather access. The landform will be re-graded and contoured to be compatible with surrounding natural landscape. All areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree and shrub species similar to the surrounding vegetation community. Remaining infrastructure will be subject to obtaining appropriate approvals.
2	Tailings Storage Area	All tailings infrastructure will be removed and tailings capped and rehabilitated. Use of rehabilitated tailings emplacements for post-closure infrastructure is unlikely due to increased stability risks, and rehabilitation will consist of stable, undulating, self draining, landforms with a cover of pasture grass.
3	Water Management Area	Under the Ashtonfield Agreement the major water storage dams will remain after operations cease. After removal of associated infrastructure, disturbed areas will be seeded with a pasture grass seed mix or native species depending on surrounding vegetation. Remaining infrastructure will be subject to obtaining appropriate approvals.
4	Overburden Emplacement	The landform will be graded and contoured to be compatible with surrounding natural landscape. Shaped overburden emplacement areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree and shrub species similar to the surrounding vegetation community. This will result in a mix of rural pasture and habitat enhancement areas blending with the surrounding landscape.
5	Active Mining Area	After mining operations conclude the remaining final void will be utilised as a rejects disposal area. After operations are completed (est 2030) the landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible. The mining void remaining in the post mining landscape will be safe, stable and non-polluting. Final void batters will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree and shrub species similar to the surrounding vegetation community.

Code	Domain Name	Rehabilitation Objectives
C & D	Rehabilitated Areas	These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works.

5.3 Rehabilitation Phases

The fundamental rehabilitation objective for Bloomfield is to create stable, non-polluting post mining landforms and allow the achievement of the agreed post mining land use. This will be achieved through a series of conceptual phases which are described as:

1. Decommissioning – removal of hard stand areas, buildings, contaminated materials, hazardous materials;
2. Landform Establishment – incorporates slope, aspect, drainage, substrate material characterisation and morphology;
3. 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 in terms of the preferred vegetative cover;
4. Ecosystem and Land Use Establishment – incorporates revegetated lands and habitat augmentation, species selection, species presence and growth together with weed and pest animal control /management and establishment of flora;
5. 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
6. Rehabilitation Complete – completion criteria for rehabilitation are met and the land is determined to be suitable to be relinquished from the mining tenement.

A summary of the rehabilitation phases proposed for completion at the end of the MOP term is provided in Table 13.

Table 13: Rehabilitation Phases Proposed for Completion at the End of the MOP Term

Rehabilitation Phase	Domain					
	Infrastructure Areas	Tailings Storage Area	Water Management Area	Overburden Emplacement	Active Mining Area	Rehabilitated Areas
Active	✓	✓	✓	✓	✓	
Phase 1 Decommissioning*		✓				
Phase 2 Landform Establishment						
Phase 3 Growth Medium						
Phase 4 Ecosystem and land use establishment						✓
Phase 5 Ecosystem and land use sustainability						✓
Phase 6 Rehabilitation Complete						

* Note: U-Cut tailings facility expected to commence decommissioning before the end of MOP term.

No additional rehabilitation at Bloomfield will be relinquished during the MOP period. For further information on Relinquished Lands refer to Section 7.4. The objectives, criteria and performance indicators for the domains for each rehabilitation phase are provided in Table 14.

6 Performance Indicators and Completion Criteria

In accordance with the ESG3 Mining Operations Plan (MOP) Guidelines the performance criteria, measure and indicators have been defined for each domain in context of the phase of the rehabilitation program. This includes the following:

- Nomination and justification of *performance measures*. Performance measures are used to quantify the rehabilitation and land management programme in terms of efficiency or effectiveness and establish the indicative timeframes for completion, and the standards of completion;
- Identification of *performance indicators* of the biophysical environment or where applicable; the built environment that can be measured reliably over time using accepted scientific techniques and standards i.e. Australian Standards; and
- Establishment of the *performance/completion criteria* for each indicator which quantitatively demonstrates rehabilitation.

The objectives, performance indicators, measures and criteria in the MOP are designed to form the basis of the performance measure and provide the ability to track the development of sustainable ecosystems through a series of conceptual stages. This information is provided for all defined rehabilitation domains in Table 14 and aligned to Plans 3A-3C.

Table 14: Rehabilitation Table – Objectives, Performance Indicators, Measures and Criteria

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Phase 1 - Decommissioning					
Domain 1 - Infrastructure					
Where not required in the Ashtonfield Agreement, all buildings, fixed plant and powerlines will be demolished and removed from the site. Under the Ashtonfield Agreement designated roads will be left in a maintained condition at the end of operations suitable for 2WD or 4WD dry weather access.	Services disconnected and removed.	All infrastructure not required, or identified for post-closure landuse, removed. Remaining infrastructure subject to obtaining appropriate approvals.	Ashtonfield Agreement	No	Not commenced
	Buildings and fixed plant removed.				
	All road infrastructure required left in place in maintained condition.				
	Sealed roads not required to be stripped of bitumen surface.				
	Hazardous and contaminated materials removed and remediated.	Carbonaceous material removed from CHPP area and placed in mine void.	Landscape Management Plan		
		Phase 2 Contamination Assessment carried out. Contaminated materials remediated or removed from site in accordance with Schedule B1 NEPM Guidelines.			
Domain 2 – Tailings Storage Area					
All infrastructure used for transporting water and fine rejects slurry between the U-Cut Tailings Dam and the CHPP will be removed. Piezometers will be left behind to measure groundwater movement as part of monitoring program.	Services disconnected and removed.	All infrastructure not required, or identified for post-closure landuse, removed. Piezometers remaining subject to appropriate approval / licences.	Ashtonfield Agreement	No	In progress
	All pumping infrastructure removed.				

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Domain 3 – Water Management Area					
Under the Ashtonfield Agreement the major water storage dams will remain after operations cease. All infrastructure used for transporting water between storage dams and the CHPP will be removed.	All pumping infrastructure removed	All infrastructure not required, or identified for post-closure landuse, removed. Remaining infrastructure subject to obtaining appropriate approvals.	Ashtonfield Agreement	No	Not commenced
	Services disconnected and removed.				
	Lake Foster and Lake Kennerson drained of process water and mine water under EPL conditions	Retained water storage dams spilling water quality would satisfy ANZECC (2000) Guidelines	ANZECC Guidelines for Fresh and Marine Waters		
		Harvestable rights for retained dams will be determined and any actions to satisfy these rights will be addressed prior to mine closure	Water Management Act 2000		
Phase 2 – Landform Establishment					
Domain 1 - Infrastructure					
The landform will be re-graded and contoured to be compatible with surrounding natural landscape.	Maximum slopes gradients less than 10°.	< 10 degrees	Ashtonfield Agreement	No	Not commenced
	Drainage designed to utilise existing sediment control structures.	Completed	Landscape Management Plan		
	Area deep ripped to reduce compaction.	Completed			
	Track banks and batters trimmed to achieve landform matching surrounding landform.	Completed			
	Unnecessary culverts removed.	Completed			
	Natural drainage paths re-instated, utilising appropriate sediment controls if necessary.	Completed			

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Domain 2 – Tailings Storage Area					
Overburden material that has been left in close proximity to the Tailings Storage Dam will be relocated to cap tailings material. The landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible.	Capping of reject / tailings material	2 metres	Ashtonfield Agreement	No	Not commenced
	Slope gradients generally less than 10°, no slopes greater than 18°.	< 18 degrees.	Ashtonfield Agreement		
	Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape.	Completed	Landscape Management Plan		
Domain 3 – Water Management Area					
Where no longer required for post-closure water management, diversion drains and sediment ponds will be backfilled and rehabilitated, and levees breached and stabilised to allow natural catchment flow.	Diversion drains and banks pushed in an ripped	Completed		No	Not commenced
Domain 4 – Overburden Emplacement					
The landform will be safe and stable and contoured to be compatible with surrounding natural landscape.	Slope gradients generally less than 10°, no slopes greater than 18°.	< 18 degrees.	Landscape Management Plan	No	Ongoing
	Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape, whether rehabilitated or natural.	Completed	Landscape Management Plan		
	After shaping, landform deep ripped and rock raking undertaken if required tp prepare surface for soil material placement.	Completed	Landscape Management Plan		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Domain 5 – Active Mining Area					
After mining operations conclude the remaining final void will be utilised as a tailings disposal area. After tailings operations are completed (est 2030) the landform will be graded and contoured to be compatible with surrounding natural landscape as far as possible. Final landform is safe, stable and non-polluting. Overburden material that has been left in close proximity will be relocated to cap tailings material. (Refer to Domains 2 & 4 for Phases 3, 4 & 5)	Capping of reject / tailings material	2 metres	Ashtonfield Agreement	No	Not commenced
	Low wall slope gradients generally less than 10º, no slopes greater than 18º.	< 18 degrees.	Ashtonfield Agreement		
	Drainage designed to utilise existing sediment control structures and integrated with the drainage features on the adjacent landscape.	Completed	Landscape Management Plan		
Phase 3 – Growth Medium Development					
Domain 1 - Infrastructure					
The areas will be top dressed with appropriate top soil material to provide suitable growth medium.	Suitable top soil material applied	Minimum 100mm of growth media	Landscape Management Plan	No	Not commenced
	Biosolids application, if required	100 t/Ha	NSW EPA Biosolids Guidelines		
	Soil ameliorant application (OGM, Lime, Gypsum) if required.	Dependent on soil analysis	Dependent on soil analysis		
	Soil surface prepared in roughened condition.	Ripping completed	Landscape Management Plan		
	Tracks deep ripped to reduce compaction	Ripping completed	Landscape Management Plan		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Domain 2 – Tailings Storage Area					
The areas will be top dressed with appropriate top soil material to provide suitable growth medium.	Suitable top soil material applied	Minimum 100mm of growth media	Landscape Management Plan	No	Not commenced
	Biosolids application, if required	100 t/Ha	NSW EPA Biosolids Guidelines		
	Soil ameliorant application (OGM, Lime, Gypsum) if required.	Dependent on soil analysis	Dependent on soil analysis		
	Soil surface prepared in roughened condition.	Ripping completed	Landscape Management Plan		
Domain 3 – Water Management Area					
Remaining disturbed areas after removal of any infrastructure will be ripped to develop a suitable growth medium for pasture and native tree species	Diversion drain soil surface prepared in roughened condition	Ripping completed	Landscape Management Plan	No	Not commenced
Domain 4 – Overburden Emplacement					
The areas will be top dressed with appropriate top soil material to provide suitable growth medium.	Suitable top soil material applied	Minimum 100mm of growth media	Landscape Management Plan	No	Ongoing
	Biosolids application, if required	100 t/Ha	NSW EPA Biosolids Guidlines		
	Soil ameliorant application (OGM, Lime, Gypsum) if required.	Dependent on soil analysis	Dependent on soil analysis		
	Soil surface prepared in roughened condition.	Ripping completed	Landscape Management Plan		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Phase 4 – Ecosystem and Land Use Establishment					
Domain 1 - Infrastructure					
All areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree and shrub species similar to the surrounding vegetation community	Appropriate pasture grass species or native seed selected.	Species selected as per Section 7	Landscape Management Plan	No	Not commenced
	Seeding rate	Pasture 50 kg /Ha, native trees 7.5 kg /Ha			
Domain 2 – Tailings Storage Area					
Areas overlying tailings material will be seeded with a pasture seed mix only to reduce the risk of subsurface combustion. These areas will be suitable for grazing purposes.	Appropriate pasture grass species selected.	Species selected as per Section 7	Landscape Management Plan	No	Not commenced
	Seeding rate	Pasture 50 kg /Ha			
Domain 3 – Water Management Area					
The areas will be seeded with pasture grass seed or native tree species depending on surrounding vegetation.	Appropriate pasture grass species or native seed selected.	Species selected as per Section 7	Landscape Management Plan	No	Not commenced
	Seeding rate	Pasture 50 kg /Ha, native trees 7.5 kg /Ha			
Domain 4 – Overburden Emplacement					
Shaped overburden emplacement areas will be seeded with a pasture grass seed mix suitable for grazing purposes or seeded with a mix of native tree and shrub species similar to the surrounding vegetation community. This will result in a mix of rural pasture and habitat enhancement area blending with surrounding landscape.	Appropriate pasture grass species or native seed selected.	Species selected as per Section 7	Landscape Management Plan	No	Ongoing
	Seeding rate	Pasture 50 kg /Ha, native trees 7.5 kg /Ha			

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
Phase 5 – Ecosystem and Land Use Sustainability					
Domain 1 - Infrastructure					
Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community.	Stable water management structures such as diversion drains and stock dams	Water management structures functioning as designed.	Landscape Management Plan	No	Not commenced
	Ground cover %	>70%, or combined live and litter cover of 70% in tree areas	Landscape Management Plan		
	Litter cover %	Present at 75% of sites with 20% litter cover.	Landscape Management Plan		
	Presence of rill erosion	Monitoring indicates rills remaining stable in number and size. <30cm wide and deep.	Landscape Management Plan		
	Presence of weeds	No significant infestations of declared weeds. Weeds controlled in accordance with relevant legislation Weeds account for <15% of total herbage mass	Landscape Management Plan Noxious Weeds Act 1993 Weed Management Plan		
	Soil pH	pH 4.5 - 9	ACARP Project C13048 (2004)		
	Soil EC	EC <0.6 dS/m	ACARP Project C13048 (2004)		
	Soil EAT Class	Class 3-8	ACARP Project C13048 (2004)		
	Tree species displaying successful recruitment	Monitoring results show evidence of successful recruitment	Landscape Management Plan		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
	Tree species assemblages and health characteristic of species found within region	Tree species composition and health is comparable to analogue site	Landscape Management Plan		
	LFA monitoring results	Stability index >50 Infiltration index >25 Nutrient cycling index >20	Landscape Management Plan		
	Soil substrate and pasture cover	Comparable with non-mined grazing reference site			
Domain 2 – Tailings Storage Area					
Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures.	Stable water management structures such as diversion drains and stock dams	Water management structures functioning as designed.	Landscape Management Plan	No	Not commenced
	Ground cover %	>70%	Landscape Management Plan		
	Presence of rill erosion	Monitoring indicates rills remaining stable in number and size <30cm wide and deep	Landscape Management Plan		
	Presence of weeds	No significant infestations of declared weeds. Weeds controlled in accordance with relevant legislation Weeds account for <15% of total herbage mass	Landscape Management Plan Noxious Weeds Act 1993 Weed Management Plan		
	Soil pH	pH 4.5 - 9	ACARP Project C13048 (2004)		
	Soil EC	EC <0.6 dS/m	ACARP Project C13048 (2004)		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
	Soil EAT Class	Class 3-8	ACARP Project C13048 (2004)		
	LFA monitoring results	Stability index >50 Infiltration index >25 Nutrient cycling index >20	Landscape Management Plan		
	Soil substrate and pasture cover	Comparable with non-mined grazing reference site	Landscape Management Plan		
Domain 3 – Water Management Area					
Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community.	Stable water management structures such as diversion drains and stock dams	Water management structures functioning as designed.	Landscape Management Plan	No	Not commenced
	Ground cover %	>70%, or combined live and litter cover of 70% in tree areas	Landscape Management Plan		
	Presence of rill erosion	Monitoring indicates rills remaining stable in number and size <30cm wide and deep	Landscape Management Plan		
	Presence of weeds	No significant infestations of declared weeds. Weeds controlled in accordance with relevant legislation Weeds account for <15% of total herbage mass	Landscape Management Plan Noxious Weeds Act 1993 Weed Management Plan		
	Lake water pH	pH 6.5 – 8.5	ANZECC Guidelines for Fresh and Marine Waters		
	Lake water EC	EC 125-2200 uS/cm	ANZECC Guidelines for Fresh and Marine Waters		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
	Lake water TSS	<50 mg/L	ANZECC Guidelines for Fresh and Marine Waters		
	Tree species displaying successful recruitment	Monitoring results show evidence of successful recruitment	Landscape Management Plan		
	Tree species assemblages and health characteristic of species found within region	Tree species composition and health is comparable to analogue site			
Domain 4 – Overburden Emplacement					
Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community.	Stable water management structures such as diversion drains and stock dams	Water management structures functioning as designed.	Landscape Management Plan	No	Ongoing
	Ground cover %	>70%, or combined live and litter cover of 70% in tree areas	Landscape Management Plan		
	Litter cover %	Present at 75% of sites with 20% litter cover.	Landscape Management Plan		
Pasture developed to point of sustainability capable of supporting appropriate livestock grazing pressures and native vegetation developed with evidence of natural regeneration of similar species to the surrounding vegetation community.	Presence of rill erosion	Monitoring indicated rills remaining stable in number and size <30 cm wide and deep	Landscape Management Plan	No	Ongoing
	Presence of weeds	No significant infestations of declared weeds. Weeds controlled in accordance with relevant legislation Weeds account for <15% of total herbage mass	Landscape Management Plan Noxious Weeds Act 1993 Weed Management Plan		
	Soil pH	pH 4.5 - 9	ACARP Project C13048 (2004)		
	Soil EC	EC <0.6 dS/m	ACARP Project C13048 (2004)		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
	Soil EAT Class	Class 3-8	ACARP Project C13048 (2004)		
	Tree species displaying successful recruitment	Monitoring results show evidence of successful recruitment	Landscape Management Plan		
	Tree species assemblages and health characteristic of species found within region	Tree species composition and health is comparable to analogue site			
	LFA monitoring results	Stability index >50 Infiltration index >25 Nutrient cycling index >20	Landscape Management Plan		
	Soil substrate and pasture cover	Comparable with non-mined grazing reference site	Landscape Management Plan		
Domain C & D – Rehabilitated Areas					
These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works.	Stable water management structures such as diversion drains and stock dams	Water management structures functioning as designed.	Landscape Management Plan	No	Ongoing
	Ground cover %	>70% , or combined live and litter cover of 70% in tree areas	Landscape Management Plan		
	Litter cover %	Present at 75% of sites with 20% litter cover.	Landscape Management Plan		
	Presence of rill erosion	Monitoring indicates rills remaining stable in number and size <30cm wide and deep	Landscape Management Plan		

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
These areas require maintenance and monitoring only. Maintenance may include periodic fertiliser application, weed management and soil conservation works.	Presence of weeds	No significant infestations of declared weeds. Weeds controlled in accordance with relevant legislation Weeds account for <15% of total herbage mass	Landscape Management Plan Noxious Weeds Act 1993 Weed Management Plan	No	Ongoing
	Soil pH	pH 4.5 - 9	ACARP Project C13048 (2004)		
	Soil EC	EC <0.6 dS/m	ACARP Project C13048 (2004)		
	Soil EAT Class	Class 3-8	ACARP Project C13048 (2004)		
	Tree species displaying successful recruitment	Monitoring results show evidence of successful recruitment	Landscape Management Plan		
	Tree species assemblages and health characteristic of species found within region	Tree species composition and health is comparable to analogue site			
	LFA monitoring results	Stability index >50 Infiltration index >25 Nutrient cycling index >20	Landscape Management Plan		
	Pasture herbage mass	>800 kg DM/ha	Landscape Management Plan		
	Pasture % dead matter	<50%			
	Crude protein of pasture	>2%			
	Digestibility of pasture dry matter	>40%			
	Metabolisable energy of pasture	>6MJ/kg DM			

Objective	Performance Indicator	Completion Criteria	Justification	Complete (Yes/No)	Progress at end of MOP
	Potential stocking rates	2-4 DSE/Ha	NSW DPI Beef Stocking Rates and Farm Size – Hunter Region (2006)		
	Soil substrate and pasture cover	Comparable with non-mined grazing reference site	Landscape Management Plan		

7 Rehabilitation Implementation

7.1 Status at MOP Commencement

As at the commencement of the MOP term a total of 488 Hectares had been rehabilitated (including Relinquished Lands). At the commencement of this MOP all available areas have been rehabilitated. For the purposes of this MOP all rehabilitated areas at the commencement of the MOP term are represented as Secondary Domains.

A summary of the rehabilitation status of each of the primary domains is provided in Table 15. The rehabilitation status at the commencement of the MOP period is shown in Plan 2.

Table 15: Rehabilitation Status of Domains at MOP Commencement

Primary Domain	Status
Infrastructure Area	Active
Tailings Storage Area	Active
Water Management Area	Active
Overburden Emplacement	Active, with areas subject to progressive rehabilitation during MOP term
Active Mining Area	Active
Secondary Domain	**Status**
Rehabilitated Areas - Pasture	317 Ha completed at start of MOP term
Rehabilitated Areas - Trees over Pasture	171 Ha completed at start of MOP term
Relinquished Lands*	21 Ha completed at start of MOP term

* Note: 21 Ha included in total rehabilitated area figure (ie 488 Ha)

7.2 Proposed Rehabilitation Activities this MOP Period

All domains will remain active throughout the term of this MOP and only a small area will be available for rehabilitation in 2020. Other rehabilitation activities will include maintenance of existing rehabilitation in accordance with Section 8.

Throughout the term of this MOP overburden emplacement operations will be conducted within the mine void. This will involve backfilling the lower areas of the void and against existing highwalls towards the final landform. The highwalls on the southern and western lease boundary will

eventually be backfilled to ground level. Shaping and rehabilitation of existing overburden emplacement areas will not be able to continue until backfilling areas within the void has reached the final landform. As a result there will be only 5 Ha landform available for rehabilitation during the term of this MOP.

At the commencement of this MOP all available areas have been rehabilitated. Areas within the Overburden Emplacement domain that are not delineated for future reshaping are to be used for stockpiling of soil material.

The annual sequence is shown in Plan 3A to 3C which present the progressive development of the open cut and the overburden emplacement domain for the MOP term. During the term of the MOP any rehabilitation activities will be undertaken within the Overburden Emplacement domain. All other domains will remain active throughout the term of this MOP. Rehabilitation monitoring activities, as described in Section 8, will continue in the previously rehabilitated areas.

Table 16 provides a summary of the proposed disturbance and rehabilitation activities.

Table 16: Disturbance and Rehabilitation Progression during the MOP Term

Year	Total Disturbance Area (Ha)	Total Rehabilitation Area (Ha) (per MOP year)	Cumulative Rehabilitation Area	Comments / Explanation
Start of MOP	402	-	488	Cumulative rehabilitation area includes relinquished lands
2018	9*	0	488	No new rehabilitation activities scheduled
2019	20*	0	488	No new rehabilitation activities scheduled
2020	-5**	5	493	
End of MOP	426	-	493	

* New disturbance for year

** Rehabilitation

7.2.1 Domain 4 – Overburden Emplacement

As stated above, should the opportunity arise throughout the term of this MOP some areas within the Overburden Emplacement domain may be subject to progressive rehabilitation. The following sections outline the rehabilitation activities that would be implemented.

Landform Establishment

Reshaping will principally involve recontouring overburden dumps into the designed shape for final rehabilitation. The bulk movement of overburden is usually undertaken using bulldozers. Ideally, reshaping will result in a stable landform with slopes and drainage patterns which blend in with the surrounding natural topography. Slope stability is integral to rehabilitation design and slopes in excess of 10 degrees will not be favoured. However, slopes steeper than 10 degrees may be necessary in some locations to ensure rehabilitation merges with adjacent undisturbed land.

Any reject emplacements integrated into the landform being reshaped will be covered by at least two meters of inert material. Site experience has found this to be the minimum cover required to ensure successful long-term revegetation over reject materials.

Once bulk reshaping is completed, the landform will be deep-ripped if required and the final trim/rock raking are undertaken. The ripping loosens up any near surface strata within the landform that have been compacted during placement, aiding root penetration during vegetation establishment. The final trim smooths out any wash-outs and gullies, rough edges, temporary access tracks, local steep slopes and prepares the surface for revegetation. Rock-raking the final stage of reshaping and removes or buries exposed surface rock greater than 200 mm in diameter. This raking is usually done along the contour, leaving a cultivated surface that assists with erosion minimisation until vegetation can be established.

Suitable drainage will also be integrated into the rehabilitation design, to ensure the final landform can safely shed surface runoff without erosion damage being caused. Until an adequate vegetation cover is re-established, there is a high potential for erosion, resulting in resource loss, gully formation and the need for expensive remedial treatment. Therefore, long or steep slopes should be divided up by the construction of contour banks to collect and divert water off the slopes. Contour banks should run the surface water at a drop of no greater than 1 in 100 into a drainage line (via a sediment dam) or into some form of protected drop structure that will run the water down the gradient in a controlled or protected manner.

Drainage design for rehabilitation will be integrated with the drainage features on the adjacent landscape, whether mine disturbed, rehabilitated or natural. Sufficient sediment control structures should be integrated into the drainage system to reduce, or intercept, sediment load being transported by surface run-off.

Growth Medium Development

Revegetation of the reshaped landform will generally undertaken in accordance with the steps below:

- Soil amelioration – spreading and integration of soil/spoil ameliorants into surface layer to address soil acidity and assist with soil structural properties. Ameliorants usually include lime and/or gypsum at a rate determined by soil testing results, ploughed into the top 30cm of the profile.
- Topdressing - if available, topsoil stripped ahead of mining will be applied to the reshaped surface in an even layer not less than 100mm. Depending on the quality of the topdressing material, ameliorants may be integrated with topsoil at this stage. Where topsoil has not been available in sufficient volumes, biosolids and biosolids/mulch mix have been successfully used to improve soil structure and act as a source of nutrients, improving establishment of vegetation. Biosolids are generally applied at a rate no greater than 100 tonnes/ha (wet weight), using a tractor towed spreader trailer. A biosolids/mulch mix (1:1 ratio) has been shown to be very successful topsoil supplement and is usually applied at a rate of 200 – 250 tonnes/ha.
- Integration – once the material has been topdressed, the surface will be ripped in to integrate the topdressing material. This assists in binding the topdressing material with the underlying spoil and is a requirement of the EPA biosolids guidelines. The area is then contour cultivated to create seed entrapments and microclimates prior to sowing.

Ecosystem and Land Use Establishment

Most vegetation establishment during land rehabilitation is via direct seeding. Pasture grass mix will generally be sown so as to establish grazing pasture on areas such as steeper slopes and drainage areas to establish faster soil stability in higher potential erosion areas. Tree seed mix, as opposed to pasture grass mix, will generally be sown so as to establish tree communities on areas such as upper slopes, hill tops and flatter areas. This assists in breaking up landform profiles and increasing habitat areas in areas of lower risk of erosion. Efforts will be made to ensure that rehabilitated tree areas are not straight edged, but blend in with adjacent remnant vegetation or previously rehabilitated areas.

The rehabilitation areas will then be sown and fertilised with the selected grass and/or tree seed mixes. These works will be undertaken shortly after spreading the topsoil to avoid loss in activity of pre-existing micro flora, it also minimises the loss of topsoil due to wind and rain action.

In pasture rehabilitation areas rolling may be undertaken to press the spread seed, increasing contact with the soil and increasing the probability of germination. It also pushes down any exposed rocks, decreasing surface rockiness.

Tubestock planting will only be used when required for rapid establishment of tree screens which are not anticipated for the term of this MOP.

An indicative species list for pasture and native species is provided in Table 17. Species and rates may vary depending on availability.

Table 17: Species List

Pasture		Native	
Species	**Rate kg / Ha**	**Species**	**Rate kg / Ha**
Wimmera Rye Grass	6	Acacia implexa	0.1
Haifa Clover	6	A.decurrens	0.4
Couch Grass	4	A.falcata	0.3
Kikuyu	3	A.longifolia	0.5
Green Panic	6	A.sophorae	0.2
Phalaris	6	A.mearnsii	0.3
Lucerne	6	A.myrtifolia	0.3
Selphi Medic	6	A.ulicifolia	0.1
Tall Fescue	6	A.irrorata	0.1
		A.suaveolens	0.1
		Angophora costata	0.5
		Casuarina torulosa	0.2
		Leptospermum polygalifolium	0.1
		Syncarpia glomulifera	0.1
		Corymbia maculata	1.2
		Eucalyptus tereticornis	0.5
		E.saligna	0.2
		E.acmenoides	0.1
		E.crebra	0.3
		E.fibrosa	0.3
		E.pilularis	0.3
		E.umbra	0.1
		E.punctata	0.2
		E.haemostoma	0.3
		E.paniculata	0.1
		E.resinifera	0.2
		E.gummifera	0.1

Ecosystem and Land Use Sustainability

The progress of rehabilitated areas will be monitored as part of the ongoing assessment program which will be used to collect sufficient data on the rehabilitated land to compare against the completion criteria to assess rehabilitation development, sustainability and suitability for sign-off. Further details are provided in Section 8.

In pasture rehabilitated areas the ongoing maintenance program may also include slashing to reduce the bulk vegetative matter. As well as providing surface mulch, this also reduces the fire hazard of those areas. Grazing on older established rehabilitation areas may also be conducted to reduce fuel loads.

7.3 Summary of Rehabilitation Area during the MOP Term

As explained within this MOP, there will be no new landform available for rehabilitation during the term of this MOP. Table 18 shows the rehabilitation phases for each domain, indicating that there will be no scheduled rehabilitation completed during the term of this MOP.

Table 18: Rehabilitation Summary during the MOP Term

Domain	Total Area at MOP start (ha) (Derived from Plan 2)	Area Affected / Rehabilitated (ha)
		Total Area at MOP end
Infrastructure Area		
Active	69	67
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total	**69**	**67**
Tailings Storage Area – U Cut		
Active	79	
Decommissioning		84
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total	**79**	**84**

Domain	Total Area at MOP start (ha) (Derived from Plan 2)	Area Affected / Rehabilitated (ha) Total Area at MOP end
Tailings Storage Area – S Cut		
Active		10
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total		**10**
Water Management Area		
Active	12	12
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total	**12**	**12**
Overburden Emplacement		
Active	169	174
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total	**169**	**174**
Active Mining Area		
Active	73	79
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete		
Total	**73**	**79**

Domain	Total Area at MOP start (ha) (Derived from Plan 2)	Area Affected / Rehabilitated (ha) Total Area at MOP end
Secondary Domain – Rehabilitated Area - Pasture		
Active		
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		5
Ecosystem and land use sustainability	317	317
Rehabilitation Complete		
Total	**317**	**322**
Secondary Domain – Rehabilitated Area – Trees over Pasture		
Active		
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability	171	171
Rehabilitation Complete		
Total	**171**	**171**
Secondary Domain – Relinquished Lands		
Active		
Decommissioning		
Landform Establishment		
Growth Medium Development		
Ecosystem and land use establishment		
Ecosystem and land use sustainability		
Rehabilitation Complete	21	21
Total	**21**	**21**

7.4 Relinquishment Phase Achieved during MOP Term

“Relinquished Lands”, i.e. the following parameters have been met:

- The area is self-sustaining,
- Has been signed off by all parties,
- The lease (or a portion of a greater lease) is relinquished;
- The security bond has been returned; and
- The mine would have no further responsibility for these areas.

The Relinquished Lands at the start of the MOP term is shown on Plan 2 and Table 17. This area was relinquished by the Department of Mineral Resources (DMR) in 2004. A copy of the DMR clearance is provided in Appendix 3.

No additional areas of the Mining Lease will be deemed to be ‘relinquished lands” at the end of the MOP term.

8 Rehabilitation Monitoring and Ongoing Maintenance

8.1 Rehabilitation Monitoring

The aim of the monitoring program is to collect sufficient data on the rehabilitated land to compare against the completion criteria to assess rehabilitation development, sustainability and suitability for sign-off. The monitoring program consists of three components:

- Maintenance inspections;
- Rehabilitation monitoring; and
- Review of inspection/measurement data over time to assess rehabilitation performance.

Monitoring is currently undertaken at 24 locations shown on Plan 2. Monitoring is conducted every two years and during the period of this MOP monitoring will be conducted in 2019. Monitoring will be designed to collect sufficient evidence (i.e. landscape, soils, vegetation, landuse, water quality) to prove achievement of rehabilitation objectives. Cost, repeatability and practicality of the proposed monitoring methodology will also be considered, along with the long-term availability of resources to ensure monitoring completion.

Rehabilitation practices and relevant site details are documented during the rehabilitation process so that future rehabilitation assessment data can be correctly interpreted. This is undertaken immediately following the establishment of each new area of rehabilitation.

8.1.1 Monitoring Methodology

The following rehabilitation monitoring methodology is based on research into rehabilitation completion criteria for rehabilitation establishment on coal mines by Nichols (2005) and Grigg, Emmerton & McCallum (2001). Provided that it is conducted by experienced operators, it will reliably indicate long term rehabilitation sustainability. The following considerations were incorporated into monitoring program design:

1. Representative monitoring sites will be established in rehabilitation of different ages. Density of monitoring sites should be based on age and heterogeneity of rehabilitation. For new rehabilitation one monitoring site per 50 ha is recommended. Although no specific density is recommended for older established rehabilitation (>5 years), sufficient density of sites should be monitored to ensure coverage of different rehabilitation types and standards. Sites locations should be selected so that all rehabilitated landscape and vegetation types are covered (i.e. treed, pasture, slopes, flat ground). .
2. Sites should be monitored within the first 12 months after establishment then every 2 years. This should provide 3 sets of monitoring data in the first 5 years following rehabilitation.
3. A standard monitoring plot design is shown in Figure 1. The standard measurements to be conducted at each measurement site are outlined in the Section 8.1.2.

4. In addition to the measurement protocols conducted every two years, all rehabilitated areas should be inspected every year. These inspections should note problem areas (such as bare patches, failed vegetation, drainage structure failure, significant erosion or significant weed infestation) requiring maintenance or further treatment. Remedial works should then be scheduled to address these areas.

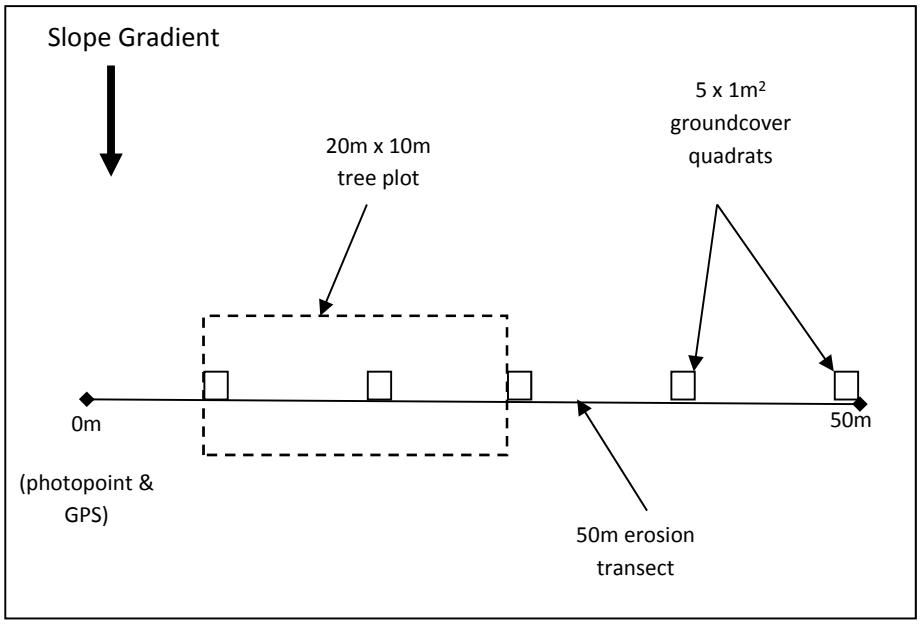


Figure 1 - Standard Layout of Rehabilitation Monitoring Transect

8.1.2 Standard Monitoring Protocol

Site Establishment

Each site will consist of a 50m transect, positioned along the contour of the slope, and permanently marked using steel pickets, or similar.

Photo and General Rehabilitation Condition

- GPS co-ordinates will be recorded for the 0m picket.
- Direction of the transect (to nearest cardinal point – N, SW, etc) from the 0m picket will be noted.
- A photo will be taken from the 0m marker of the general condition of rehabilitation in the vicinity of the transect.
- A brief description of the general condition (i.e. “rhodes dominated pasture grass with scattered shrubs and trees”) and any stand-out issues (evidence of fire, bare patches, weed infestations, tree die back or erosion) will be provided.

- A sketch will be made of the transect location in relation to prominent nearby landmarks.
- Landform gradient in the vicinity of the transect will be noted.

Weeds

Note presence of declared noxious weeds in vicinity of transects, or substantial infestations of weeds that may out compete or otherwise hinder rehabilitation establishment.

Fauna

Note evidence of fauna re-colonisation in rehabilitation along transect, including insects and birds.

Vegetation

The following measurements will be recorded to assess vegetation establishment:

- Five x $1m^2$ quadrats will be established (at the 0m, 10m, 20m, 30m & 40m marks). Groundcover estimate (%), number of groundcover species and dominant groundcover species (top 2 spp.) to be recorded for each quadrat.
- If trees or shrubs are present, one 20m x 10m plot, located 5m either side of the transect centreline will be established. Number of trees and shrubs taller than 1.2m will be recorded by species (if not known, allocate a number and record by genus – Acacia 1, Euc 2, etc). Stems/ha (total and for dominant spp/genus) should be calculated by multiplying plot results by 50.
- Evidence of recruitment (seedlings and small saplings) along transect should be noted. If possible, note species/genus and distance to nearest mature tree of that species/genus.
- Record general condition of tree health along the transect. Specifically recording evidence of senescence, drought stress, nutrient deficiencies, disease or severe insect attack. If applicable, note if specific species/genus are impacted.

Nutrient Recycling

- Record the percent coverage and average depth of litter layer in each quadrat.
- Note the degree of litter layer composition.
    - 0 = Nil: Litter lying loose on surface with little indication of decomposition or incorporation;
    - 1 = Minor: Litter broken down into smaller fragments in contact with soil surface or slightly incorporated.
    - 2 = Moderate or greater: Litter has started to form layers, with lower layers demonstrating evidence of decomposition activity.
- Record the presence of cryptograms (algae, fungi, mosses, lichens, etc):
    - 0 = Nil evidence;
    - 1 = Minor: <10% cover.
    - 2 = Moderate or greater: >10% cover

Soils/surface Condition

For the characterisation of soil properties, the following actions should be taken along each transect:

- Note significant soil surface characteristics likely to influence rehabilitation development, including excessive surface rockiness, surface cracking, surface precipitates (salts, gypsum, etc), surface hard setting, etc.
- In each of the 5 vegetation plots, note surface rockiness (0=nil surface rock; 1= <10% coverage and/or rocks generally < 25mm diameter; 2 = >10% rock coverage or rocks largely > 25mm diameter), surface horizon soil field texture and surface roughness (0 = surface generally smooth with little capability of impeding surface flow; 1 = some minor cracking or undulations generally <2cm; 2 = dense surface cracking or undulations generally >2cm)
- Excavate a representative soil profile hole and record the surface horizon characteristics – depth, colour, structure, root zone depth, rock content and field texture.
- Collect surface soil samples for analysis, as required to meet operation-specific soil characterisation criteria.

Erosion and Stability

The following landform attributes should be noted to monitor for evidence erosion and stability:

- Note the presence and, if possible, the cause of scalds or bare patches > $2m^2$ along the length of the 50m transect.
- Record the location and dimension of all erosion rills >30cm wide and/or 30cm deep, where they intersect the 50m transect. Note whether the rills are active or inactive (inactive rills are usually found in areas of well-established ground-cover and are filled/partially filled with sediment and/or vegetation established within the rill). The number of active rills deeper or wider than 30cm will be converted to a density per 50m for comparison with subsequent monitoring data.
- Note any failed water management structures (contour banks, drop structures, sediment ponds, etc).

8.1.3 Monitoring Review and Reporting

Monitoring data will be reviewed upon completion of monitoring. Remedial actions for significant anomalies detected during monitoring (i.e. failed rehabilitation, failed water management structures, significant weed infestations) will be included in environmental works planning.

Monitoring data will be compared with previous years' data, to identify long-term trends in rehabilitation development. Once three sets of data have been collected, this information will be compared to completion criteria and areas deemed suitable for sign-off will be identified.

Rehabilitated areas that are not progressing towards the completion criteria will also be identified and corrective strategies devised or monitoring period extended.

The results of rehabilitation monitoring will be reported in the Annual Review Report.

8.2 Research and Rehabilitation Trials and Use of Analogue Sites

No trials or research are proposed to be undertaken during the term of this MOP.

Data from analogue sites in good condition areas near to the rehabilitated area is imperative for sensible comparisons of data. An analogue transect is installed in a pasture area outside the current open cut area and beyond the current area planned to be mined into the future. This transect is designed to act as reference sites for the study, monitoring the effects of environmental factors above those incurred by rehabilitated lands. The area where this transect occurs has previously been affected by agriculture and underground mining, however it has not been subjected to open cut operations.

The rehabilitation requirements under the development consent is a mix of pasture and native vegetation that does not conflict with future land use (Section 4.2 and 4.3). There is no requirement to establish a particular vegetation community on rehabilitated land. However an analogue transect is installed in a woodland area outside the open cut area. This analogue transect will be designed to act as reference site for the study of flora species assemblages.

9 Intervention and Adaptive Management

9.1 Threats to Rehabilitation

Bloomfield has completed an overarching risk assessment to identify the potential threats to the success of rehabilitation for the operations. Details of the risk assessment are outlined in Section 3 and a copy of this risk assessment is provided in Appendix 2.

9.2 Trigger Action Response Plan

The following Trigger Action Response Plan (TARP) identifies the proposed contingencies strategies in the event of unexpected variations or impacts to rehabilitation outcomes with data as obtained from the monitoring programs and performance criteria and indicators as stipulated in Section 6 of this MOP.

The key risks associated with site rehabilitation have been assessed using the maximum reasonable consequence ratings, likelihood ratings, risk matrix and classifications (Environmental Risk Identification Matrix) presented in Section 3. Table 19 outlines the key identified risks, triggers and proposed mitigation measures.

Table 19: Proposed Mitigation Measures to Reduce Key Risks

Risk	Trigger	Proposed Mitigation Measure
Geotechnical failure of emplacement area such as slumping.	Landform not consistent with Landform Establishment as outlined in Table 14.	Review emplacement design, including survey if required. Undertake reshaping of emplacement area minimising slopes >10°.
Off-site release of contaminants from mined materials requiring long term management or treatment.	Data obtained from compliance monitoring program indicates exceedance of EPL limits.	Ongoing monitoring of runoff and seepage waters during operations to validate predictions. Mitigation measures as proposed in the WMP.

Risk	Trigger	Proposed Mitigation Measure
Wind and water erosion leading to degradation of growth medium and rehabilitation quality.	Monitoring indicates excessive erosion (ie rilling >30cm depth and width) resulting in land stability vegetation growth issues.	Ensure appropriate erosion and sedimentation controls and drainage lines will be employed during rehabilitation activities. Maintenance earth and revegetation works will be undertaken in the areas where erosion has been noted. Annual monitoring detailed above will be designed to determine the type, source, degree, and location of potential erosion sites and source of sediment.
Inadequate or insufficient topsoil to create/enhance the desired ecological communities.	Monitoring and vegetation assessments highlight inadequate ground cover and /or paucity in species diversity / distribution as outlined in Table 14. Soil analysis indicates soil parameters are not compatible to post mining vegetation community as outlined in Table 14. Topsoil balance indicates potential shortfall.	Review soil management procedures and amend as appropriate. Implement maintenance revegetation program including seeding, tubestock planting of native overstorey species, fertiliser. Implement soil testing and amend growing media by the addition of soil ameliorants as required eg; lime, gypsum, mulch, biosolids. Assess soil for weed contamination and treat affected soil.
Impact of weeds and /or vertebrate pest animal leading to widespread failure of revegetation ecosystems.	Monitoring and vegetation assessments highlight increased weed competition and vertebrate pest activity when compared with reference site as outlined in Table 14.	Careful use of weed free topsoil and/or topsoil management. Encourage rapid establishment of ground cover species designed to outcompete weed species. Assessment and management of weed incursions on topsoil stockpiles prior to respreading. Weed control undertaken in accordance with the requirements of the *Noxious Weeds Act 1993.* Control of pest animal species in accordance with industry guidelines.

Risk	Trigger	Proposed Mitigation Measure
Poor vegetation establishment success.	Monitoring data indicates non-compliance with performance criteria of the monitoring program in terms of landscape function, biodiversity and pasture productivity as outlined in Table 14.	Review species mix and, if required, adjust to achieve the targeted ecosystem. Pasture species selection will be reviewed in context of pasture productivity. Conduct remedial treatment such as soil amelioration, reseeding etc.
Pasture areas not suitable for grazing productively.	Monitoring data indicates non-compliance with performance criteria of the monitoring program in terms of pasture productivity as outlined in Table 14.	Pasture species selection will be reviewed in context of pasture productivity. Conduct remedial treatment such as soil amelioration, reseeding etc.
Spontaneous combustion destabilising land surface and impeding vegetation establishment	Significant or continued spontaneous combustion surface impacts.	Apply capping, or dig out affected area where possible and seal, remedial earthworks with inert material and revegetate. Spontaneous Combustion Management Plan
Asset Protection Zone (APZ) an unacceptable bushfire risk.	APZ not maintained as per advice from RFS.	Control and maintain a suitable Asset Protection Zone surrounding rehabilitation areas by slashing and controlled grazing.
Major storm event resulting in flooding, geotechnical instability, major erosion and/or widespread damage to rehabilitated areas.	Actual severe storm event and localized flooding. Monitoring program indicates lack of adequate ground cover as outlined in Table 14.	Design final landforms, drainage structures and revegetation to cope with major storm events. Implement maintenance program on rehabilitation and sediment structures.
Severe and/or prolonged drought leading to widespread failure of revegetation.	Monitoring and vegetation assessments highlight inadequate ground cover and / or paucity in species diversity / distribution following a drought as outlined in Table 14.	Re-seeding with a selection of drought-tolerant species for revegetation. Selection of species aligned to desired vegetation community. Time seeding/plantings to take advantage of ideal weather conditions. Assess against reference site to determine if impact rehabilitation specific.

Risk	Trigger	Proposed Mitigation Measure
Changing climate leading to failure of rehabilitation, failure of environmental management controls and/or inability to attain completion criteria.	Monitoring and vegetation assessments highlight inadequate ground cover and / or paucity in species diversity / distribution as outlined in Table 14. Soil analysis indicates soil parameters are not compatible to post mining vegetation community as outlined in Table 14.	Assess climate change risks and implement appropriate measures where required. Use of biosolids, compost materials and mulches to increase organic carbon levels and improve soil structure with resultant increase in infiltration and water holding capacity.
New regulatory requirements or evolving community expectations leading to difficulties negotiating or attaining completion criteria.	Changes in relevant legislation.	Monitor trends and developments in legislation and changes to community expectations. Consult with stakeholders to gain acceptance of completion criteria.

10 Reporting

10.1 Incident Reporting

Incident reporting procedures are in place to ensure that relevant agencies are notified in the format required (verbal and or phone) and in accordance with the timeframes of the licence or Approval. Records of these reports will be stored in accordance with the site based EMS.

10.2 Company Website

The company website will be checked and updated on a regular basis – at least monthly – to ensure that all monitoring data, reports and other documentation as stipulated in the Project Approval (Schedule 5 Condition 8) is available.

10.3 Annual Environmental Management Report /Annual Review

Bloomfield prepares an Annual Environmental Management Report (AEMR), now termed 'Annual Review' in accordance with the NSW Government Integrated Mining Policy and with the requirements of ML1738. This annual report compiles monitoring results and discusses trends, system changes and responses to any potential issues identified during monitoring. Targets and future initiatives are also identified.

Also as required under the Development Consent, Bloomfield undertakes an Annual Review of the environmental performance of the project, which is reported in the Annual Review Report. This review includes:

- Describe the works (including any rehabilitation) that were carried out during the previous calendar year, and the works that are proposed to be carried out over the current calendar year;
- Include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:
  - relevant statutory requirements, limits or performance measures/criteria;
  - monitoring results of previous years; and
  - relevant predictions in the EAs;
- Identify any non-compliance over the previous calendar year, and describe what actions were (or are being) taken to ensure compliance;
- Identify any trends in the monitoring data over the life of the project;
- Identify any discrepancies between the predicted and actual impacts of the project, and
- Analyse the potential cause of any significant discrepancies.

11 Plans

The following plans have been prepared in consideration of the Plan requirements in the MOP Guidelines and are attached:

- Plan 1A - Pre Mining Environment – Project Locality;
- Plan 1B - Pre mining environment – Natural environment
- Plan 1C - Pre mining environment – Built environment
- Plan 2 - Mine Domains at Commencement of the MOP;
- Plan 3A - Mining and Rehabilitation (2018)
- Plan 3B - Mining and Rehabilitation (2019)
- Plan 3C - Mining and Rehabilitation (2020)
- Plan 4A - Final Rehabilitation and Post Mining Land Use (Abel Resumes Operations);
- Plan 4B - Final Rehabilitation and Post Mining Land Use (Abel in Care & Maintenance);
- Plan 5A - Mining Land Use Cross Sections (Abel Resumes Operations); and
- Plan 5B - Mining Land Use Cross Sections (Abel in Care & Maintenance)

12 Reporting and Implementation of MOP

12.1 Review of the MOP

The ongoing effectiveness and efficiency of the site Management System is monitored as part of the operation's day-to-day management. Feedback from this and other more formal reviews and/ or following special occurrences, form the basis for System improvement and re-design.

In general the MOP will be reviewed on the following basis:

- Every three years; or
- Whenever there is a significant change to relevant legislation; or
- If required to do so by the Regulations; or
- Whenever there is a significant change to the operations; or
- If required (in writing) to do so by the Chief Inspector; or
- Whenever control measures are found to be ineffective either through:
  - changes to the working environment; or
  - changes to operating systems; or
  - subsequent risk assessments; or
  - the findings of an audit; or

- following a fatality or dangerous incident that could reasonably have been expected to result in a fatality; or
- following an assessment of a related safety alert.

12.1.1 Continual Improvement

Operational activities will be subject to regular review to ensure conformance with commitment made in the EMS and subordinate plans and strategies.

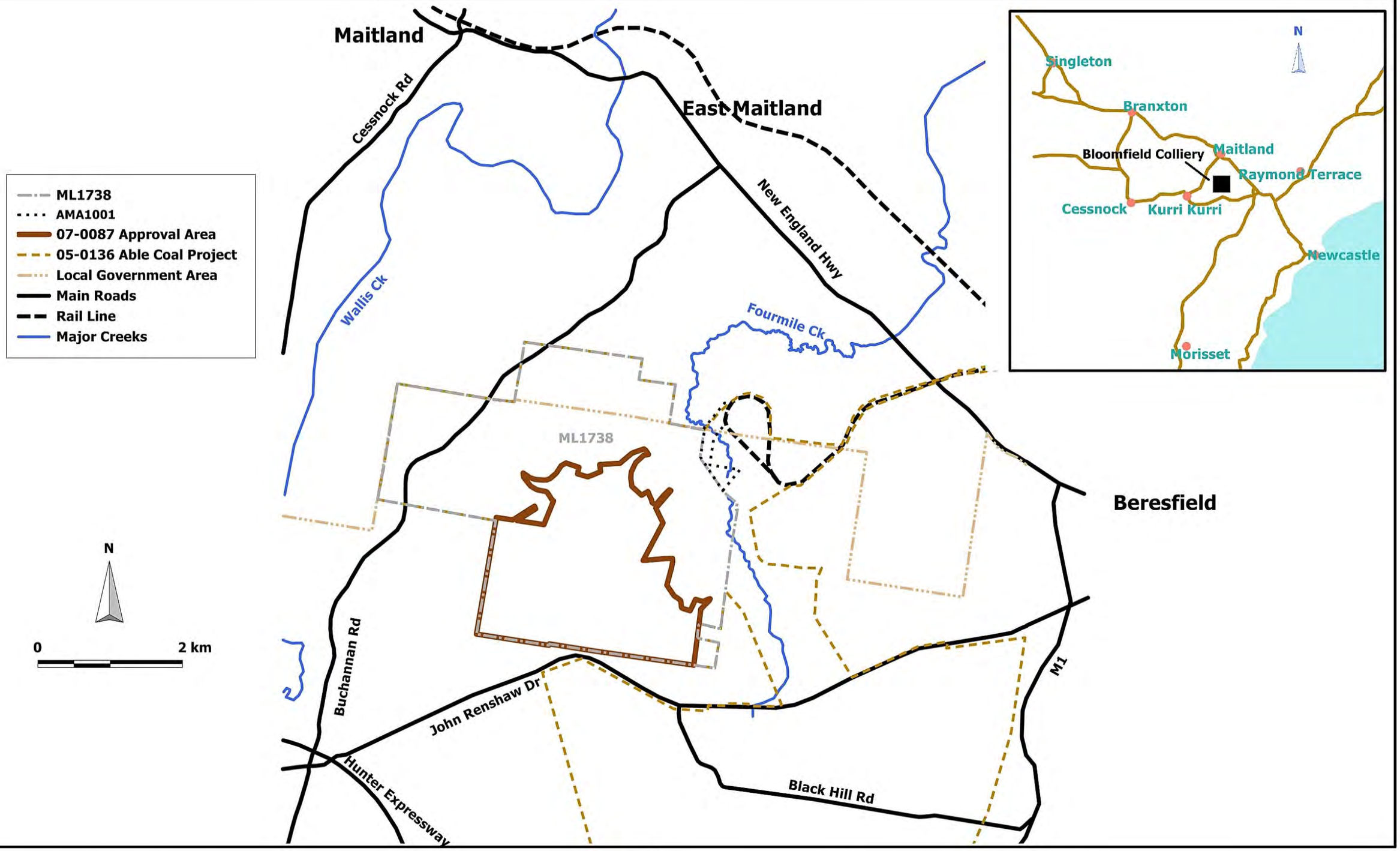
12.1.2 Document Management

Copies of this document are managed under the Group Document Management System. This document and other relevant documents are kept on site and are available to all employees.

12.2 Implementation

The Company Directors are responsible for the overall rehabilitation and environmental performance of Bloomfield Colliery The Mine manager has direct responsibility for the rehabilitation process. The Environmental Officer provides direction and advice to ensure site environmental compliance is maintained. The Environmental Officer is responsible for the implementation of the works as described in this MOP. This involves ensuring all aspects of the rehabilitation processes, as outlined in this document, are followed and carried out.

PLANS



I, Brad Donoghue, Holder of Mine Managers Certificate of Competency, certify that the information on this plan is a true indication of the proposed development

..... Mine Manager Date

I, Jeff Dunn, Registered Mine Surveyor, certify that to the best of my knowledge and belief this plan conforms to the accuracy & standards required by NSW Trade & Investment - Division of Resources and Energy

..... Registered Mining Surveyor Date

Bloomfield Colliery

Pre-mining Environment - Project Locality

Mining Operations Plan - 2018 to 2020

Date 6/04/2018

THE Bloomfield GROUP

Plan 1A

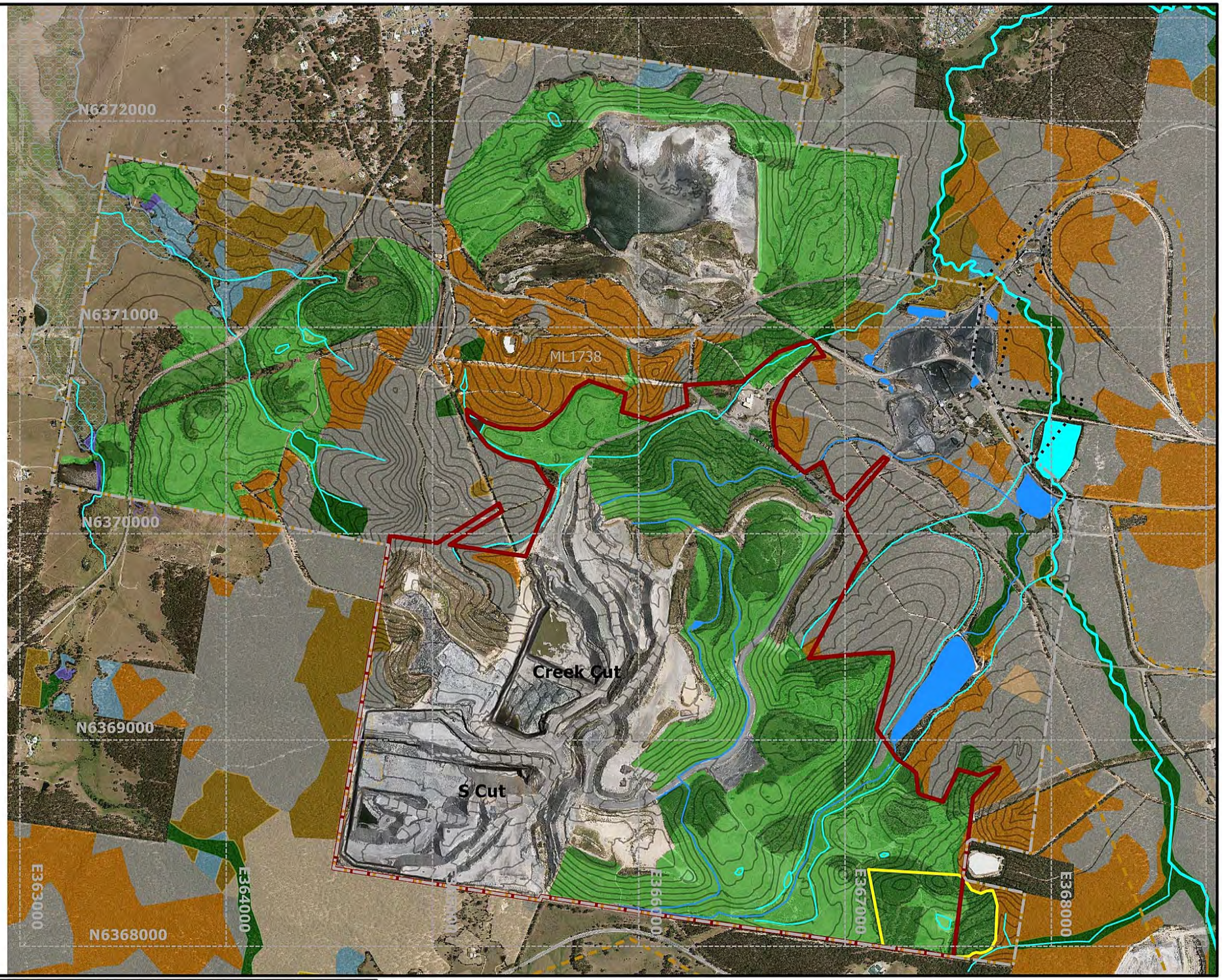
ML1738
AMA1001
07-0087 Approval Area
05-0136 Able Coal Project
Contours (5m)
Creek
Clean Water
Mine Water
Water Management Area
Relinquished Area
Flood Prone Area

Existing Rehabilitation
Pasture
Trees over pasture

Vegetation Communities
MU Alluvial Cabbage Tree
MU15 Spotted Gum - Ironbark Forest
MU17 Spotted Gum - Ironbark Forest EEC
MU18 Spotted Gum - Ironbark Forest
MU30 Smooth-barked Apple Woodland
MU35 Kurri Sands Swamp Woodland EEC
MU41 Swamp Oak - Sedge Forest
MU5 Alluvial Tall Moist Forest

Title Holder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18



N

0 1 km

Scale (A3) 1:20000
MGA Zone 56

I, Brad Donoghure, Holder of Mine Managers Certificate of Competency, certify that the information on this plan is a true indication of the proposed development

..... Mine Manager Date

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..... Registered Mining Surveyor Date

Bloomfield Colliery

Pre-mining Environment - Natural Environment
Mining Operations Plan - 2018 to 2020

Date: 14/03/2018

THE Bloomfield GROUP

Plan 1B

- ML1738
- AMA1001
- 07-0087 Approval Area
- 05-0136 Able Coal Project
- Cadastral Boundary
- Creek
- Clean Water
- Mine Water
- Water Management Area
- Powerline
- Hunter Water Pipeline
- Roads
- Rail Line
- Residences
- Infrastructure Area
- Old Underground Workings

Land Ownership

- Rathvale
- Yancoal
- Private
- Bloomfield Group
- Ashtonfield

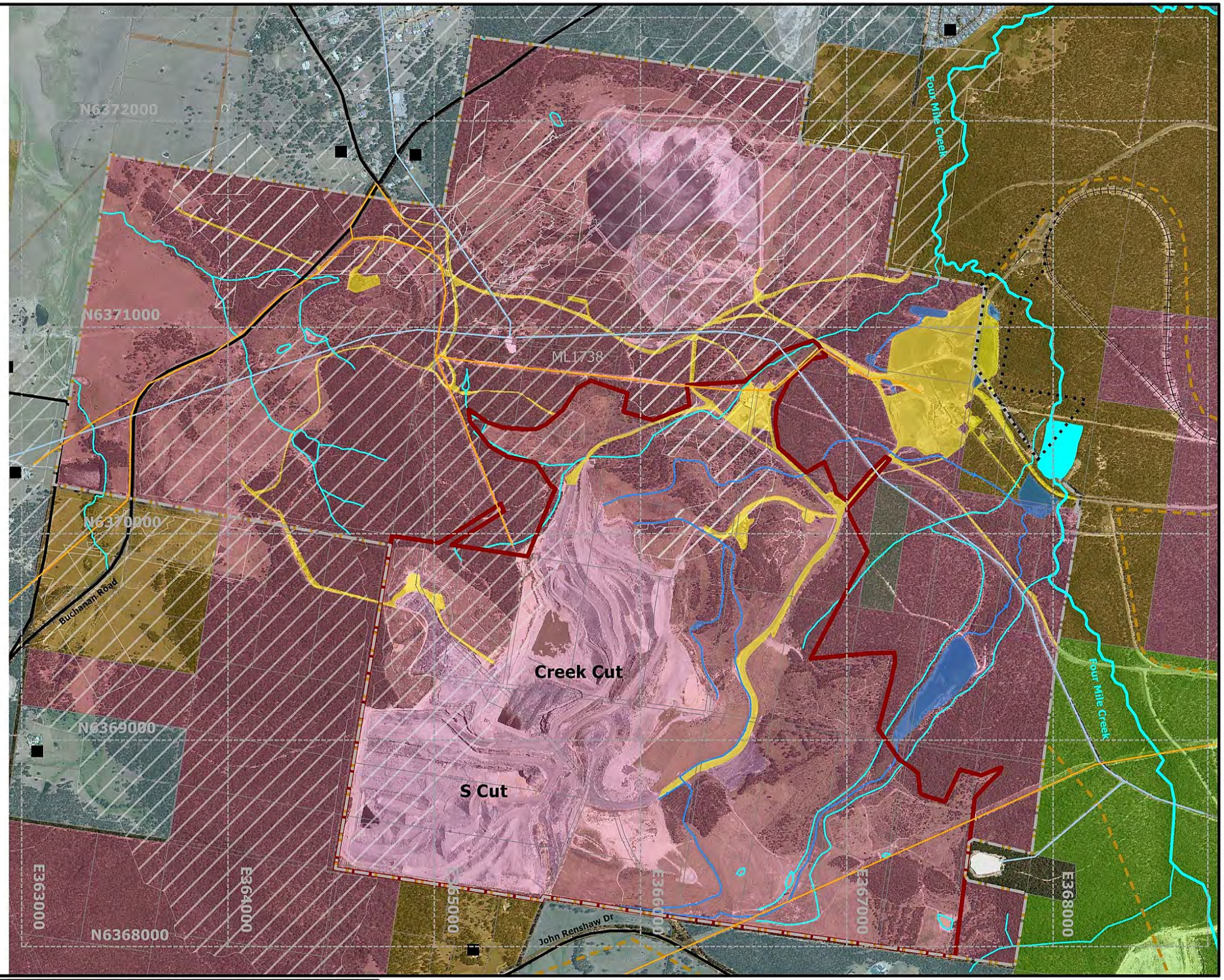
Title Holder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18

N

0 1 km

Scale (A3) 1:20000
MGA Zone 56



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..... Mine Manager Date

I, Jeff Dunn, Registered Mine Surveyor, certify that to the best of my knowledge and belief this plan conforms to the accuracy & standards required by NSW Trade & Investment - Division of Resources and Energy

..... Registered Mining Surveyor Date

Bloomfield Colliery

Pre-mining Environment - Built Environment
Mining Operations Plan - 2018 to 2020

Date: 24/04/2018

THE Bloomfield GROUP

Plan 1C

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Rehabilitation Monitoring Site
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section

Primary Mine Domains
Infrastructure Area
Tailings Storage Area
Water Management Area
Overburden Emplacement
Active Mining Area

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

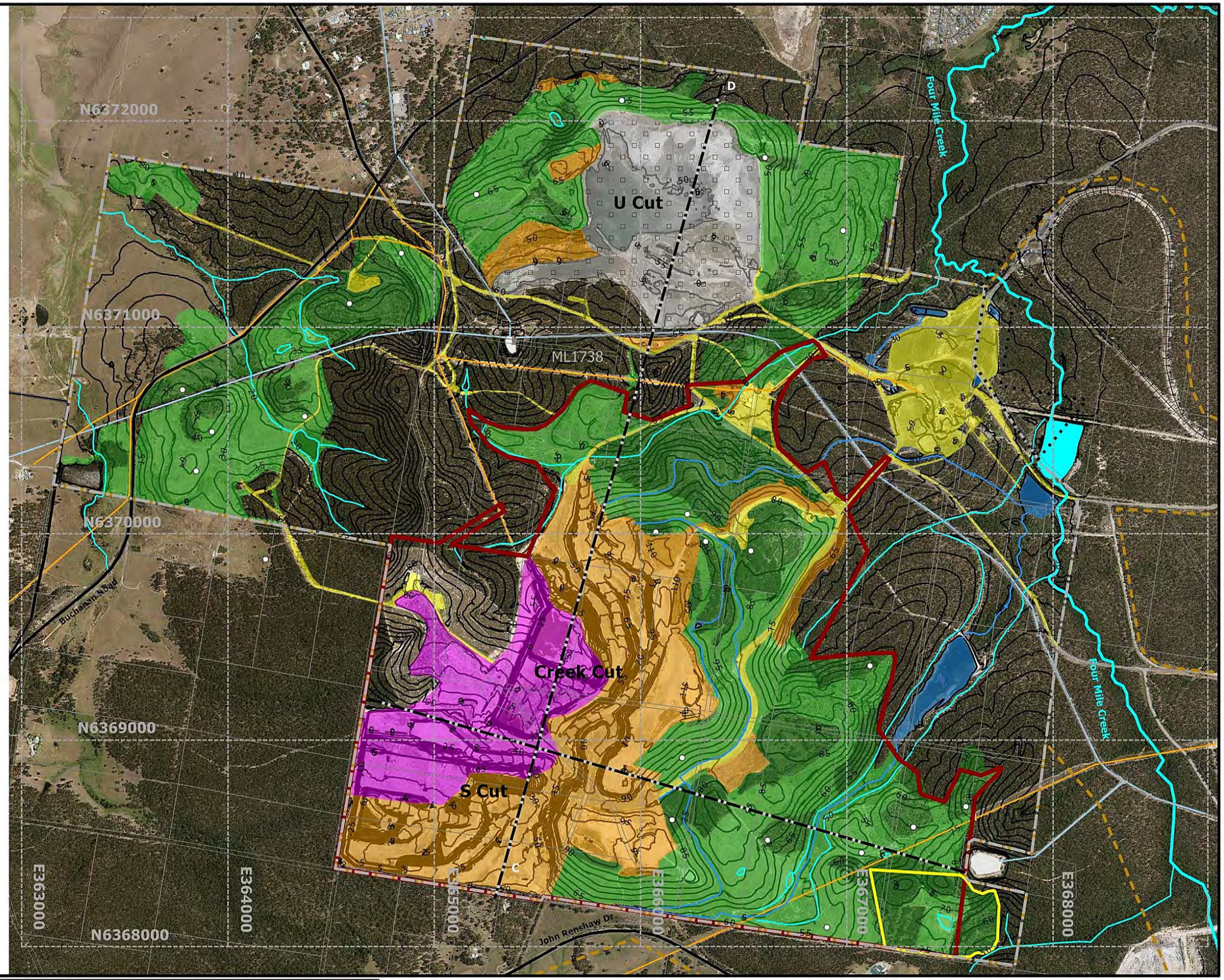
Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18

N

0 1 km

Scale (A3) 1:20000
MGA Zone 56



I, Brad Donoghue, Holder of Mine Managers Certificate of Competency, certify that the information on this plan is a true indication of the proposed development

..... Mine Manager Date

I, Jeff Dunn, Registered Mine Surveyor, certify that to the best of my knowledge and belief this plan conforms to the accuracy & standards required by NSW Trade & Investment - Division of Resources and Energy

..... Registered Mining Surveyor Date

Bloomfield Colliery

Mine Domains at Commencement of MOP
Mining Operations Plan - 2018 to 2020

Date: 10/08/2018

THE Bloomfield GROUP

Plan 2

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section

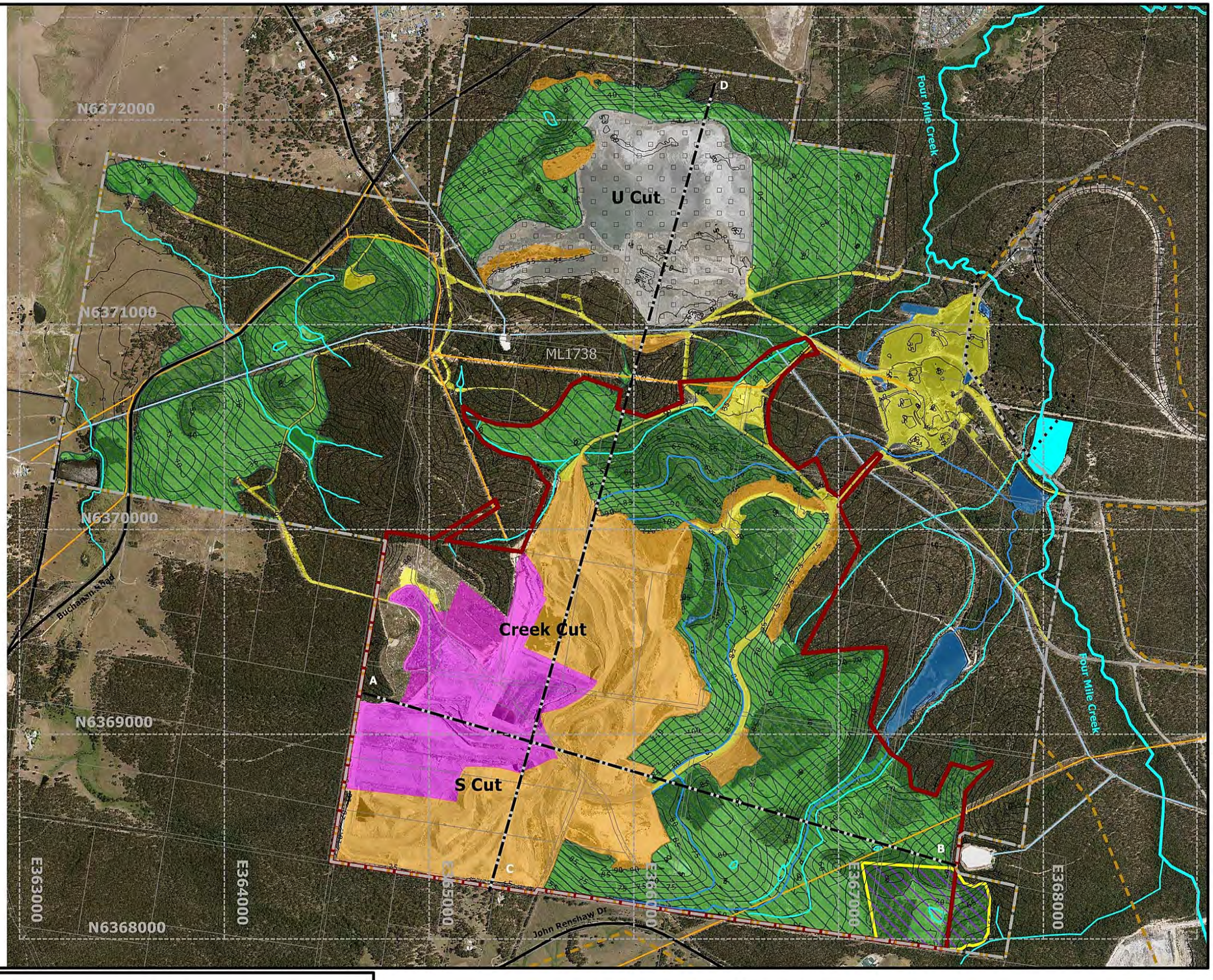
Primary Mine Domains
Infrastructure Area
Tailings Storage Area
Water Management Area
Overburden Emplacement
Active Mining Area

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

Rehabilitation Phases
Ecosystem and Land Use Sustainability
Relinquished Lands

Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18



Scale (A3) 1:20000
MGA Zone 56

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..... Registered Mining Surveyor Date

Bloomfield Colliery

Mining and Rehabilitation - 2018
Mining Operations Plan - 2018 to 2020

Date: 27/07/2018

THE Bloomfield GROUP

Plan 3A

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section

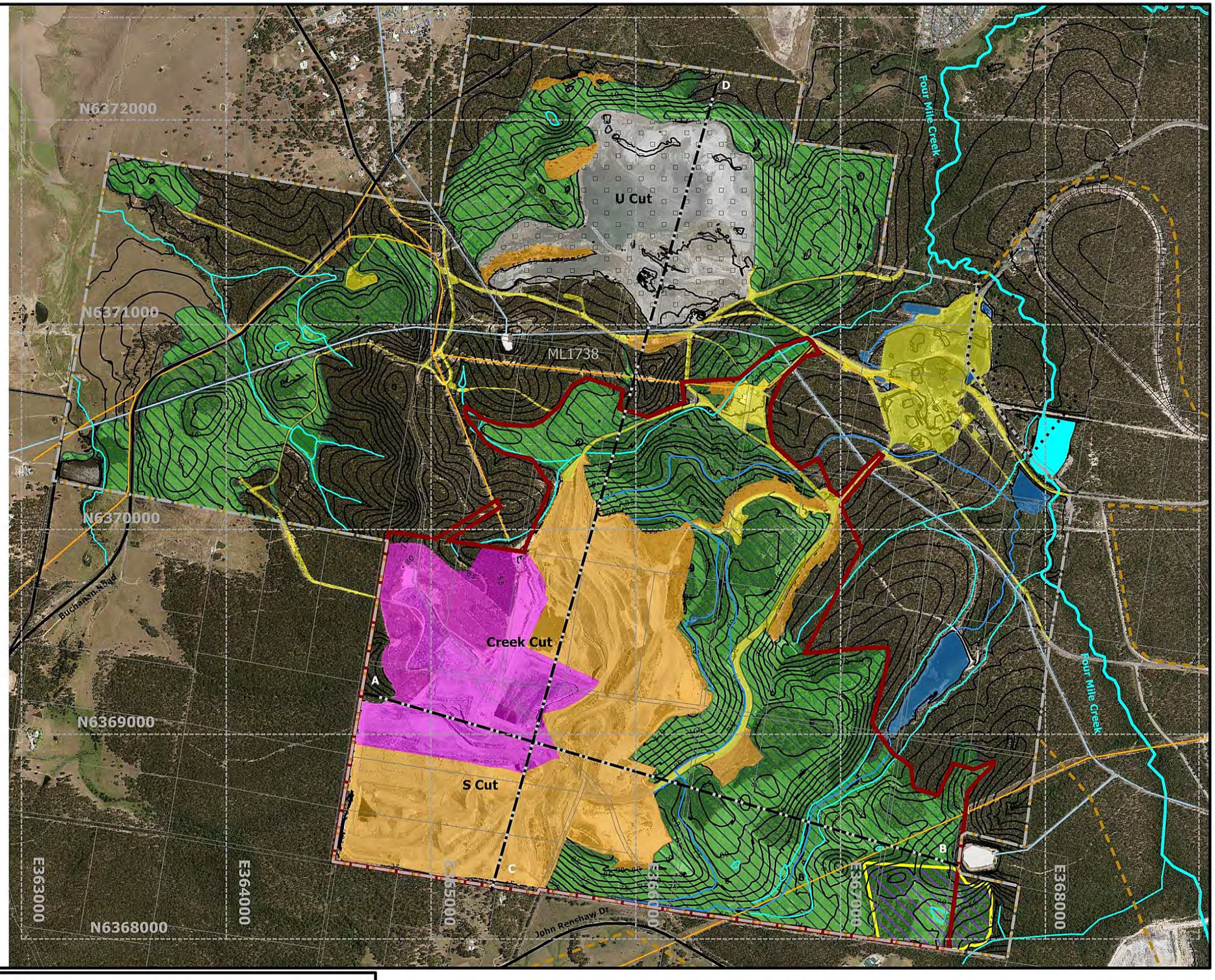
Primary Mine Domains
Infrastructure Area
Tailings Storage Area
Water Management Area
Overburden Emplacement
Active Mining Area

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

Rehabilitation Phases
Ecosystem and Land Use Sustainability
Relinquished Lands

Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18



N

0 1 km

Scale (A3) 1:20000
MGA Zone 56

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..... Registered Mining Surveyor Date

Bloomfield Colliery

Mining and Rehabilitation - 2019
Mining Operations Plan - 2018 to 2020

Date: 24/07/2018

THE Bloomfield GROUP

Plan 3B

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section

Primary Mine Domains
Infrastructure Area
Tailings Storage Area
Water Management Area
Overburden Emplacement
Active Mining Area

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

Rehabilitation Phases
Decommissioning
Ecosystem and Land Use Establishment
Ecosystem and Land Use Sustainability
Relinquished Lands

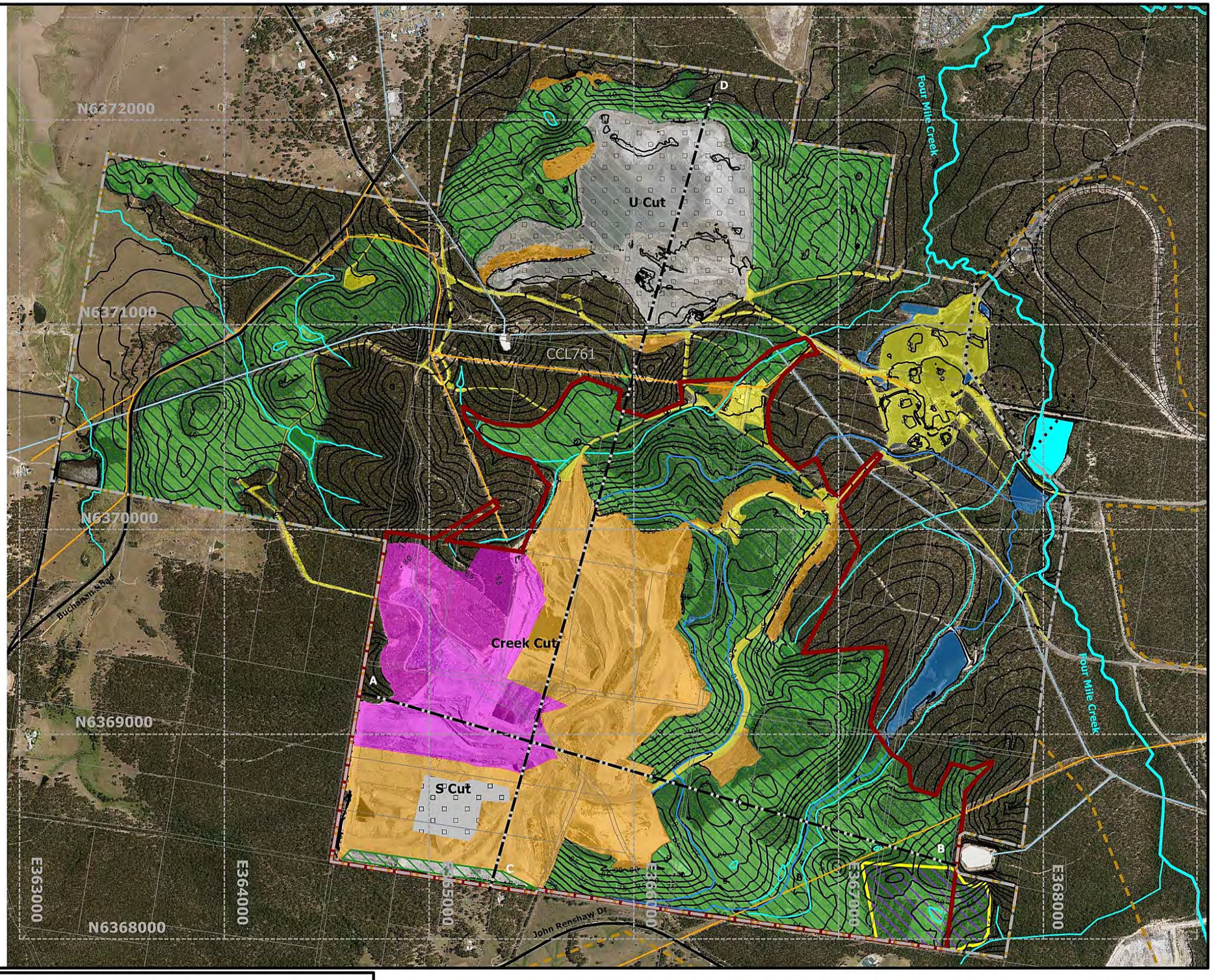
Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18

N

0 1 km

Scale (A3) 1:20000
MGA Zone 56



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..... Registered Mining Surveyor Date

Bloomfield Colliery

Mining and Rehabilitation - 2020
Mining Operations Plan - 2018 to 2020

Date: 24/07/2018

THE Bloomfield GROUP

Plan 3C

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section
Wildlife Corridor

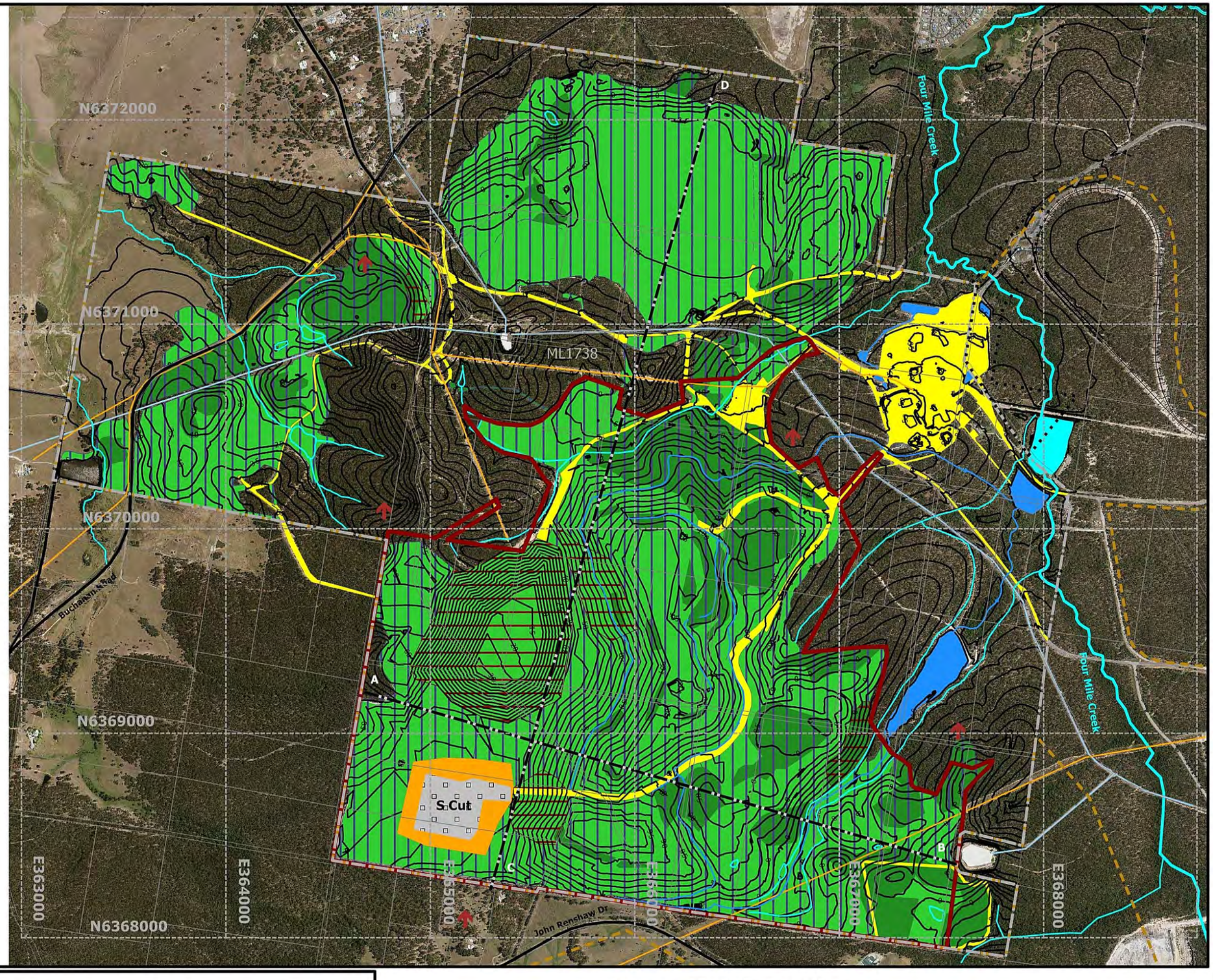
Primary Mine Domains
Infrastructure Area
Reject Storage Area
Water Management Area
Overburden Emplacement

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

Land and Soil Capability Class
L&SC Class 4
L&SC Class 5

Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18



N

0 1 km

Scale (A3) 1:20000
MGA Zone 56

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..... Registered Mining Surveyor Date

Bloomfield Colliery

Final Rehabilitation and Post Mining Land Use - 2028
Abel Coal Mine Resumes Operation
Mining Operations Plan - 2018 to 2020

Date: 14/03/2018

THE Bloomfield GROUP

Plan 4A

ML1738
AMA1001
07-0087 Approval Area
05-0136 Abel Coal Project
Cadastral Boundary
Contours (5m)
Creek
Clean Water
Mine Water
Powerline
Hunter Water Pipeline
Roads
Rail Line
Cross-section
Wildlife Corridor

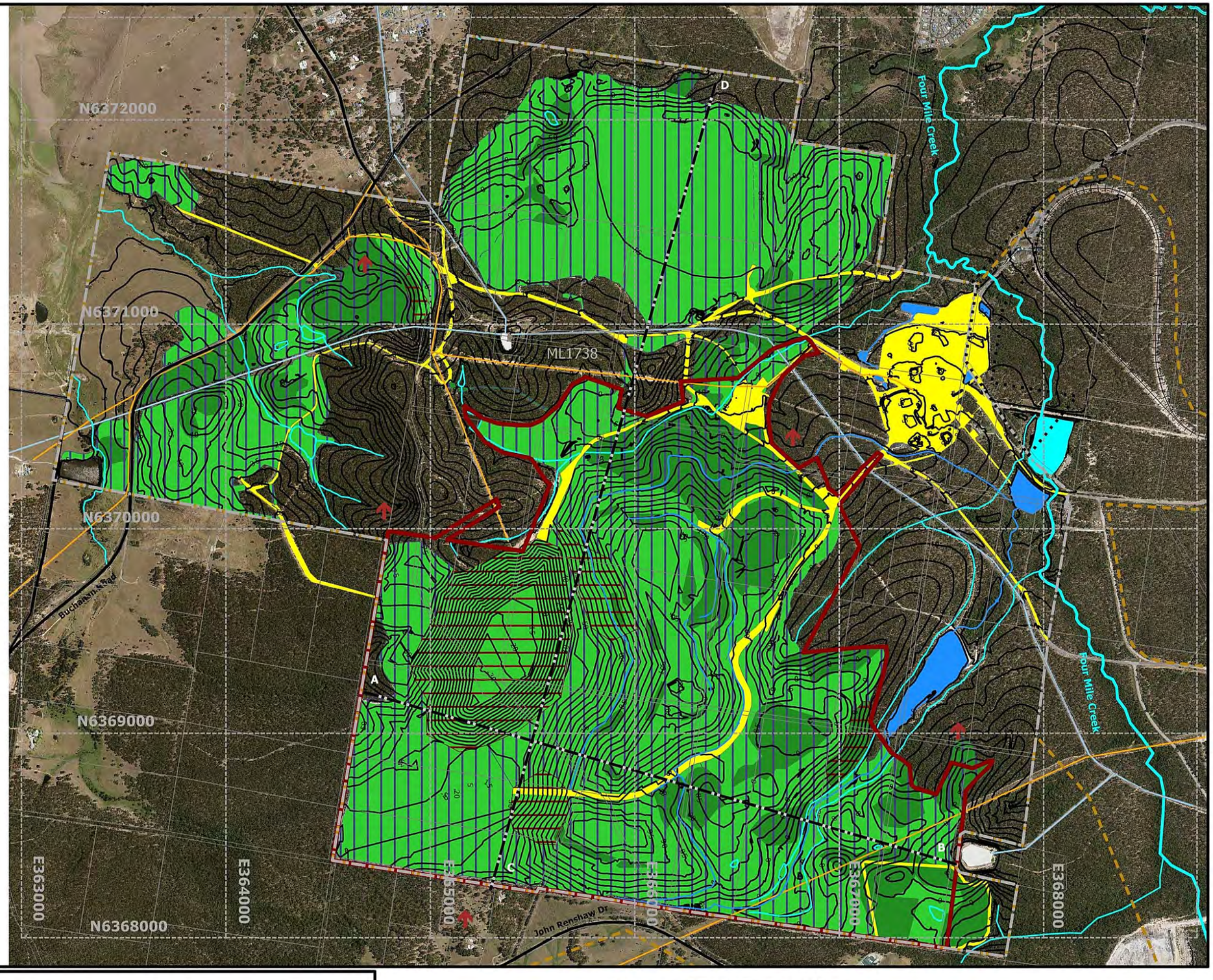
Primary Mine Domains
Infrastructure Area
Reject Storage Area
Water Management Area
Overburden Emplacement

Secondary Mine Domains
Rehabilitated Area - Pasture
Rehabilitated Area - Trees over Pasture
Relinquished Lands

Land and Soil Capability Class
L&SC Class 4
L&SC Class 5

Titleholder - Bloomfield Collieries Pty Ltd
Plan prepared by Greg Lamb

Bloomfield Orthophoto - 7/1/18



N

0 1 km

Scale (A3) 1:20000
MGA Zone 56

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..... Registered Mining Surveyor Date

Bloomfield Colliery

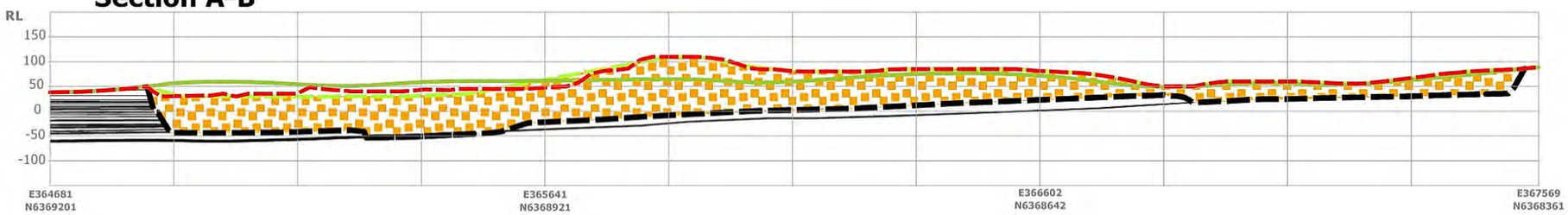
Final Rehabilitation and Post Mining Land Use - 2028
Abel Coal Mine in Care and Maintenance
Mining Operations Plan - 2018 to 2020

Date: 10/07/2018

THE Bloomfield GROUP

Plan 4B

Section A-B



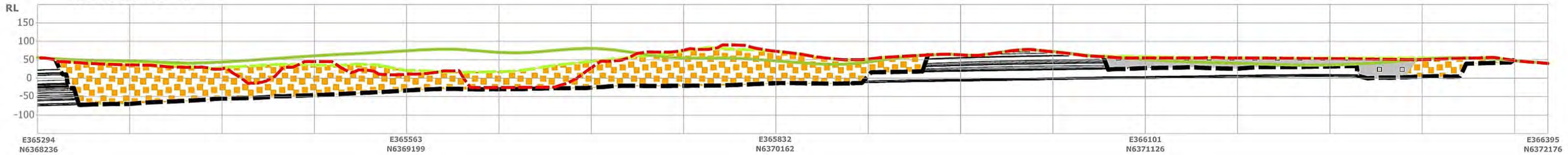
- Natural Surface
- Current Surface
- Final Surface
- Floor of Open Cut
- Overburden Emplacement
- Tailings Storage Area
- Coal Seams

Title Holder - Bloomfield Collieries Pty Ltd
Plan Prepared by Greg Lamb

0 500 m

Horizontal Scale (A3) 1:11000
Vertical Scale (A3) 1:11000
MGA Zone 56

Section C-D



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..... Mine Manager Date

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..... Registered Mining Surveyor Date

Bloomfield Colliery

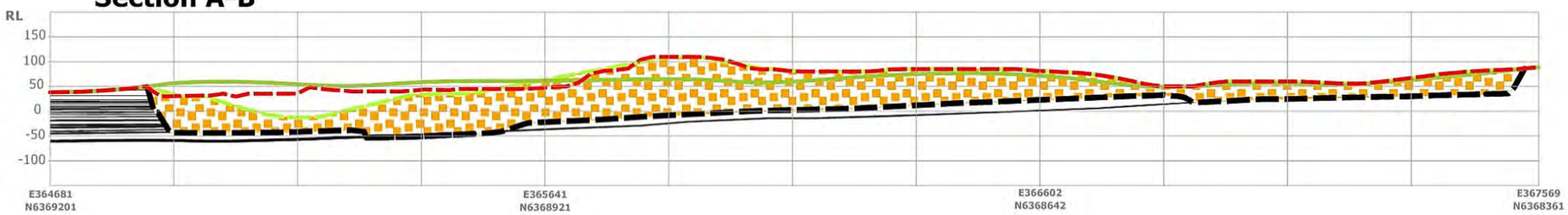
Rehabilitation and Post Mining Land Use Sections
Abel Coal Mine Resumes Operation
Mining Operations Plan - 2018 to 2020

Date: 27/6/2018

THE Bloomfield GROUP

Plan 5A

Section A-B



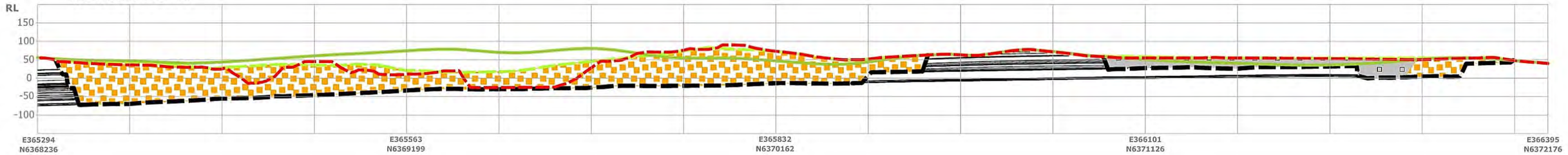
- Natural Surface
- Current Surface
- Final Surface
- Floor of Open Cut
- Overburden Emplacement
- Tailings Storage Area
- Coal Seams

Title Holder - Bloomfield Collieries Pty Ltd
Plan Prepared by Greg Lamb

0 — 500 m

Horizontal Scale (A3) 1:11000
Vertical Scale (A3) 1:11000
MGA Zone 56

Section C-D



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Bloomfield Colliery

Rehabilitation and Post Mining Land Use Sections
Abel Coal Mine in Care and Maitenance
Mining Operations Plan - 2018 to 2020

Date: 13/8/2018

THE Bloomfield GROUP

Plan 5B

APPENDIX 1

PROJECT APPROVAL 07_0087

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

As delegate of the Minister for Planning, I approve the project referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Sam Haddad
Director-General

SIGNED 3 SEPTEMBER 2009

Sydney 2009

SCHEDULE 1

Application No:	07_0087
Proponent:	Bloomfield Collieries Pty Limited
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Bloomfield Coal Project

May 2011 modification in red
March 2012 modification in blue
February 2013 modification in green
August 2018 modification in purple

TABLE OF CONTENTS

DEFINITIONS

Annual Review	The review required by condition 3 of Schedule 5
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016*
BCT	NSW Biodiversity Conservation Trust
Biodiversity Offset Strategy	The Biodiversity Offset Strategy as described in EA (MOD 1) and EA (MOD 4)
CCC	Community Consultative Committee
CHPP	Coal handling and preparation plant
Council	Cessnock City Council
Day	The period between 7am and 6pm on Monday to Saturday and between 8am and 6pm on Sunday and Public Holidays
Department	Department of Planning and Environment
DoI	Department of Industry – Lands and Water
DRG	Division of Resources and Geoscience within the Department
DSC	Dams Safety Committee
EA	Environmental Assessment prepared for the Bloomfield Group entitled *Bloomfield Colliery Completion of Mining and Rehabilitation Part 3A Environmental Assessment Project Application 07_0087* Volumes 1, 2 and 3 (November 2008), including the response to submissions dated 5 February 2009
EA (MOD 1)	Modification application 07_0087 Mod 1 and Environmental Assessment titled *Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation*, prepared by Business Environment and dated September 2010, including the Biodiversity Offset Strategy titled *Bloomfield Colliery Project Modification (07_0087 MOD 1) – Proposed Offset Strategy,* dated 31 March 2011
EA (MOD 2)	Modification application 07_0087 Mod 2 and letter entitled Bloomfield Coal Project – Modification of PA 07_0087, dated November 2011
EA (MOD 3)	Modification application 07_0087 Mod 3 as requested by letter entitled *Bloomfield Coal Project – Modification of PA 07-0087* and dated 17 December 2012
EA (MOD 4)	Modification application 07_0087 and accompanying Environmental Assessment prepared for the Bloomfield Group entitled *Bloomfield Colliery – Life of Mine Extension, Modification 4* (January 2018), including the response to submissions dated 14 June 2018
EEC	Endangered Ecological Community
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*
Evening	The period between 6pm and 10pm
Feasible	Means what is possible and practical in the circumstances
Land	The whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
LGA	Local government area
Material harm	Is harm that: • involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or • results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) This definition excludes "harm" that is authorised under either this approval or any other statutory approval'
Mining operations	The removal and emplacement of overburden and the extraction of coal
Minister	NSW Minister for Planning, or delegate
Modification 4	The modification to the project as described in EA (MOD 4)
Morning shoulder	The period between 6am and 7am, Monday to Saturday (excluding Public Holidays)
Night	The period between 10pm and 6am, Monday to Saturday and between 10pm and 8am on Sunday and Public Holidays

OEH	Office of Environment and Heritage
Privately-owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary)
Proponent	Bloomfield Collieries Pty Limited or any other person or persons who rely on this approval to carry out the project that is subject to this approval
Project	The Bloomfield Coal Project described in the EA
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
ROM	Run-of-mine
Secretary	Planning Secretary under the EP&A Act, or nominee
Site	Land to which the project application applies (see Appendix 1 and 2)
Statement of Commitments	The Proponent's Final Statement of Commitments for Site Operations and Management in Appendix 3

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent must implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

Terms of Approval

2. The Proponent must carry out the project generally in accordance with the:
   (a) EA, EA (MOD 1), EA (MOD 2), EA (MOD 3) and EA (MOD 4);
   (b) Biodiversity Offset Strategy; and
   (c) Statement of Commitments.

   Notes:
   - *The general layout of the project is shown in Appendix 2; and*
   - *The Statement of Commitments is reproduced in Appendix 3.*

2A. The Proponent must carry out the project in accordance with the conditions of this approval.

3. If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. The Proponent must comply with any reasonable requirements of the Secretary arising from the Department's assessment of:
   (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with the conditions of this approval;
   (b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with the conditions of this approval; and
   (c) the implementation of any actions or measures contained in these documents.

Limits on Approval

5. Mining operations may take place on the site until 31 December 2030.

   Note: Under this Approval, the Proponent is required to rehabilitate the site to the satisfaction of the Secretary and DRG. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.

6. The Proponent must not extract more than 1.3 million tonnes of ROM coal a year from the site.

Hours of Operation

7. Project operations may take place 24 hours per day, 7 days per week.

Management Plans / Monitoring Programs

8. With the approval of the Secretary, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

9. The Proponent must prepare revisions of any strategy, plan or program required under this project approval if directed to do so by the Secretary. Such revisions must be prepared to the satisfaction of, and within a timeframe approved by, the Secretary.

10. With the approval of the Secretary, the Proponent may integrate any strategy, plan, program, review, audit or committee required by this approval with any similar requirement under the development consent for the Donaldson Coal Mine and the project approval for the Abel Coal Mine.

Structural Adequacy

11. The Proponent must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

Demolition

12. The Proponent must ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

13. The Proponent must ensure that all plant and equipment used on site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

Community Enhancement Fund

14. The Proponent must establish a Community Enhancement Fund of a minimum of $500,000 and implement expenditure from that fund to the satisfaction of the Secretary. Proposals for expenditure from the fund must:
    (a) be prepared by the Proponent in consultation with Council and the CCC and be submitted to the Secretary for approval by 31 December 2009;
    (b) be expended over the ten calendar years 2010-2019; and
    (c) include:
        - a minimum of $180,000 on local infrastructure projects within Cessnock LGA, to be commenced no later than 30 September 2011; and
        - a minimum of $32,000 annually to locally-operating community charities.

Evidence of Consultation

15. Where conditions of this approval require consultation with an identified party, the Proponent must:
    (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and
    (b) provide details of the consultation undertaken including:
        - the outcome of that consultation, matters resolved and unresolved; and
        - details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed the matters not resolved.

Applicability of Guidelines

16. References in the conditions of this approval to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this approval.

17. However, consistent with the conditions of this approval and without altering any limits or criteria in this approval, the Secretary may, when issuing directions under this approval in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

Compliance

18. The Proponent must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this approval relevant to activities they carry out in respect of the project.

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent must ensure that the noise generated by the project does not exceed at any residence on privately-owned land, or on more than 25% of any privately-owned land, the noise impact assessment criteria shown in Table 1 for the monitoring location nearest to that residence or land:

Table 1: Operational noise impact assessment criteria dB(A)

Morning shoulder	***Day***	***Evening***	***Night***		***Location and Locality***
$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$	
40	35	35	35	45	**E** Browns Rd, Black Hill
42	35	35	35	45	**F** Black Hill Rd, Black Hill
43	39	42	37	45	**G** Buchanan Rd, Buchanan
35	35	35	35	45	**H** Mt Vincent Rd, Louth Park
35	35	35	35	45	**L** Kilshanny Ave, Ashtonfield
48	39	39	37	46	**M** John Renshaw Drive, Buttai
43	42	42	35	45	**N** Lings Road, Buttai

Note: To interpret the locations in Table 1, see Appendix 2.

However, if the Proponent has a written negotiated noise agreement with the landowner of any privately-owned land, and a copy of this agreement has been forwarded to the Department and EPA, then the Proponent may exceed the noise limits in Table 1 on that land in accordance with the negotiated noise agreement.

Cumulative Noise Criteria

2. The Proponent must take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on, or on more than 25 percent of, any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50dB(A) – Morning shoulder and Day;*
   - $L_{Aeq(4\ hour)}$ *45 dBA) – Evening; and*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

Continuous Improvement

3. The Proponent must:
   (a) implement all reasonable and feasible noise mitigation measures;
   (b) investigate ways to reduce the noise generated by the project; and
   (c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review,
   to the satisfaction of the Secretary.

Monitoring

4. The Proponent must prepare a Noise Monitoring Program for the project to the satisfaction of the Secretary. The Program must :
   (a) be prepared in consultation with EPA and be submitted to the Secretary for approval within 6 months of the date of this approval; and
   (b) include:
      - a combination of unattended and attended monitoring measures; and
      - a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval.

The Proponent must implement the Noise Monitoring Program as approved by the Secretary.

BLASTING AND VIBRATION

Airblast Overpressure Limits

5. The Proponent must ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Airblast overpressure impact assessment criteria

Airblast overpressure level (dB(Lin Peak))	***Allowable exceedance***
115	5% of the total number of blasts in a 12 month period
120	0%

Ground Vibration Impact Assessment Criteria

6. The Proponent must ensure that the ground vibration level from blasting at the project does not exceed the levels in Table 3 at any residence on privately-owned land.

Table 3: Ground vibration impact assessment criteria

Peak particle velocity (mm/s)	***Allowable exceedance***
5	5% of the total number of blasts in a 12 month period
10	0%

Blasting Hours and Frequency

7. The Proponent must carry out blasting on site only between 9 am and 5 pm Monday to Saturday. No blasting is allowed on Sundays and Public Holidays.

8. The Proponent may carry out on the site a maximum of:
   (a) 2 blasts a day; and
   (b) 5 blasts a week, averaged over a 12 month period.

Operating Conditions

9. During mining operations on site, the Proponent must implement best blasting practice to:
   (a) protect the safety of people, property, public infrastructure, and livestock; and
   (b) minimise the dust and fume emissions from blasting at the project,
   to the satisfaction of the Secretary.

10. The Proponent must not undertake blasting within 500 metres of any privately-owned land, unless suitable arrangements have been made with the landowner and any tenants to minimise the risk of flyrock-related impact to the property to the satisfaction of the Secretary.

Public Notice

11. The Proponent must:
   (a) notify the landowner/occupier of any residence within 2 kilometres of the mining area who registers an interest in being notified about the blasting schedule at the mine, or any other landowner nominated by the Secretary;
   (b) operate a blasting hotline, or alternate system agreed to by the Secretary, to enable the public to get up-to-date information on the blasting schedule at the project;
   (c) advertise the blasting hotline number in a local newspaper at least 4 times each year; and
   (d) publish an up-to-date blasting schedule on its website,
   to the satisfaction of the Secretary.

Property Inspections

12. The Proponent must advise the owners of privately-owned land that they are entitled to a structural property inspection to establish the baseline condition of buildings and other structures on the property:

(a) within 2 months of the date of this approval, for properties within 2 kilometres of blasting operations occurring at the date of this approval; and
(b) at least 2 months prior to blasting within 2 kilometres of additional properties.

If the Proponent receives a written request for a structural property inspection from any such landowner, the Proponent must:

- within 2 months of receiving this request commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to inspect the condition of any building or structure on the land (prior to blasting taking place within 2 km of the property, if possible), and recommend measures to mitigate any potential blasting impacts; and
- give the landowner a copy of the property inspection report.

Property Investigations

13. If any landowner of privately-owned land within 2 kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or other structures on his/her land have been damaged as a result of blasting at the project after the date of this approval, the Proponent must within 3 months of receiving this claim:
(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and
(b) give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent must repair the damages to the satisfaction of the Secretary.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.

Blast Monitoring Program

14. The Proponent must prepare a Blast Monitoring Program for the project to the satisfaction of the Secretary. This program must:
(a) be submitted to the Director General for approval within 6 months of the date of this approval; and
(b) include a protocol for evaluating blasting impacts on, and demonstrating compliance with, the blasting criteria in this approval for all privately-owned residences and other structures.

The Proponent must implement the Blast Monitoring Program as approved by the Secretary.

AIR QUALITY

Impact Assessment Criteria

15. The Proponent must ensure that dust emissions generated by the project do not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 4: *Air quality criteria*

Pollutant	***Averaging Period***	***Criterion***	
Particulate matter < 10 µm (PM_{10})	Annual	[a,c] 25 µg/m^3	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3	
Particulate matter < 2.5 µm ($PM_{2.5}$)	Annual	[a,c] 8 µg/m^3	
Particulate matter < 2.5 µm ($PM_{2.5}$)	24 hour	[b] 25 µg/m^3	
Total suspended particulates (TSP)	Annual	[a,c] 90 µg/m^3	
[d] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes:
[a] *Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).*

[b] *Incremental impact (i.e. incremental increase in concentrations due to the project on its own).*
[c] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.*
[d] *Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.*

Monitoring

16. The Proponent must prepare an Air Quality Monitoring Program for the project to the satisfaction of the Secretary. This program must:
    (a) be prepared in consultation with EPA and be submitted to the Secretary for approval within 6 months of the date of this approval; and
    (b) include:
        - a combination of high-volume samplers and dust deposition gauges to monitor the dust emissions of the project and provision for additional real time monitoring if required in response to monitoring results and/or complaints; and
        - an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this approval.

    The Proponent must implement the Air Quality Monitoring Program as approved by the Secretary.

METEOROLOGICAL MONITORING

17. During the project, the Proponent must ensure there is a suitable continuously operating meteorological station on or adjacent to the site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales* (DEC, 2007), or its latest version, to the satisfaction of the Secretary.

WATER MANAGEMENT

Discharge

18. Except as may be expressly provided for by an EPL, or in accordance with section 120 of the *Protection of the Environment Operations Act 1997*, the Proponent must not discharge any mine water from the site. However, water may be transferred between the site and the adjoining Donaldson Coal Mine and/or Abel Coal Mine, in accordance with any approved Water Management Plan (see below).

Water Management Plan

19. The Proponent must prepare a Water Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with EPA and DoI and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) be prepared by suitably qualified expert/s whose appointment/s have been approved by the Secretary; and
    (c) include:
        - a Site Water Balance;
        - an Erosion and Sediment Control Plan;
        - a Surface Water Monitoring Plan;
        - a Ground Water Monitoring Program; and
        - a Surface and Ground Water Response Plan.

    The Proponent must implement the Water Management Plan as approved by the Secretary.

Site Water Balance

20. The Site Water Balance must:
    (a) include details of:
        - sources and security of water supply;
        - water use and management on site;
        - any off-site water transfers or discharges; and
        - reporting procedures; and
    (b) describe measures to minimise water use by the project.

Erosion and Sediment Control

21. The Erosion and Sediment Control Plan must:
    (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction (Volume 2E – Mines and Quarries)* manual (DECC 2008), or its latest version;
    (b) identify activities that could cause soil erosion and generate sediment;
    (c) describe measures to minimise soil erosion and the potential for transport of sediment downstream;
    (d) describe the location, function and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to maintain the structures over time.

Surface Water Monitoring

22. The Surface Water Monitoring Program must include:
    (a) detailed baseline data on surface water flows and quality in creeks and other waterbodies that could potentially be affected by the project;
    (b) surface water and stream health impact assessment criteria;
    (c) a program to monitor the impact of the project on surface water flows, water quality and stream health; and
    (d) reporting procedures for the results of the monitoring program.

Groundwater Monitoring

23. The Groundwater Monitoring Program must include:
    (a) further development of the regional and local groundwater model;
    (b) detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site);
    (c) groundwater impact assessment criteria;
    (d) a program to monitor the impact of the project on groundwater levels, yield, quality, groundwater dependent ecosystems and riparian vegetation;
    (e) procedures for the verification of the groundwater model; and
    (f) reporting procedures for the results of the monitoring program and model verification.

Surface and Groundwater Response Plan

24. The Surface and Groundwater Response Plan must describe the measures and/or procedures that would be implemented to:
    (a) investigate, notify and mitigate any exceedances of the surface water, stream health and ground water impact assessment criteria;
    (b) compensate landowners of privately-owned land whose water supply is adversely affected by the project; and
    (c) mitigate and/or offset any adverse impacts on groundwater dependent ecosystems or riparian vegetation.

LANDSCAPE MANAGEMENT

Rehabilitation Objectives and Commitments

25. The Proponent must rehabilitate the site to the satisfaction of DRG and the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the documents listed in condition 2 of Schedule 2 and comply with the objectives in Table 5.

Table 5: *Rehabilitation Objectives*

Feature	***Objective***
All areas of the site affected by the project	• Safe, stable and non-polluting • Fit for the intended post-mining land use/s
Areas proposed for native ecosystem re-establishment	• Restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area. • Establish areas of self-sustaining: - riparian habitat, within any diverted and/or re-established creek lines and retained water features;

Feature	*Objective*
	- potential habitat for threatened flora and fauna species; and - wildlife corridors, as far as is reasonable and feasible.
Areas proposed for agricultural land	• Establish/restore grassland areas to support sustainable agricultural activities • Achieve the nominated land capability classification
Other land affected by the development	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species (unless DRG agrees otherwise)
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)
Final voids	• Designed as long term groundwater sinks to maximise ground water flows across back filled 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
Creek restoration works	• Engineered to be hydraulically and geomorphologically stable • Incorporate erosion control measures based on vegetation and engineering revetments • Incorporate structures for aquatic habitat • Revegetate with suitable native species
Surface infrastructure of the development	• To be decommissioned and removed, unless DRG 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

Note: *The rehabilitation objectives detailed in 5 apply to the entire site, including all landforms constructed under either this approval or previous consents. However, they do not require any additional earthmoving works to be undertaken for landforms that have been approved and constructed prior to Modification 4 or under previous consents.*

25A. The Proponent must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.

Note: *It is accepted that some parts of the site that are progressively rehabilitated may be subject to further disturbance at some later stage of the development.*

Landscape Management Plan

26. The Proponent must prepare a detailed Landscape Management Plan for the project to the satisfaction of the Secretary and DRG. This plan must:
    (a) be prepared in consultation with OEH, DoI and Council by suitably qualified expert/s whose appointment/s have been approved by the Secretary; and
    (b) include a:
        - Rehabilitation Management Plan to be submitted to the Secretary for approval within 6 months of the date of this approval;
        - Final Void Management Plan to be submitted to the Secretary for approval by 30 June 2012; and
        - Mine Closure Plan to be submitted to the Secretary for approval by 30 June 2012.

    The Proponent must implement the Landscape Management Plan as approved by the Secretary.

Rehabilitation Management Plan

27. The Rehabilitation Management Plan must include:
    (a) the rehabilitation objectives for the site;
    (b) a description of the short, medium, and long term measures that would be implemented to:
        - rehabilitate the site; and
        - manage the remnant vegetation and habitat on the site;
    (c) performance and completion criteria for the rehabilitation of the site;
    (d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:
        - minimising and rehabilitating disturbed areas;
        - protecting vegetation and soil outside the disturbance areas;
        - undertaking pre-clearance surveys;
        - managing impacts on fauna;
        - landscaping the site to minimise visual impacts;
        - conserving and reusing topsoil;
        - collecting and propagating seed for rehabilitation works;
        - salvaging and reusing material from the site for habitat enhancement;
        - controlling weeds and feral pests;
        - controlling access; and
        - bushfire management;
    (e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;
    (f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
    (g) details of who would be responsible for monitoring, reviewing, and implementing the plan.

Final Void Management Plan

28. The Final Void Management Plan must:
    (a) justify the final location and future use of the final void;
    (b) incorporate design criteria and specifications for the final void based on verified groundwater modelling predictions and a re-assessment of post-mining groundwater equilibration; and
    (c) describe what actions and measures would be implemented to:
        - minimise any potential adverse impacts associated with the final void; and
        - manage and monitor the potential impacts of the final void.

Tailings Dam Embankment

28A. Prior to any decision to construct the embankment as described in EA (MOD 4), the Proponent must submit relevant details to the DSC.

Mine Closure Plan

29. The Mine Closure Plan must:
    (a) be prepared in consultation with DRG and Council;
    (b) define the objectives and criteria for mine closure;

(c) investigate options for the future use of the site in a manner consistent with the *Lower Hunter Regional Strategy* (Department of Planning, 2006) and/or other extant regional planning strategies;
(d) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local employment levels;
(e) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
(f) describe how the performance of these measures would be monitored over time.

Biodiversity Offsets

29A. By 31 December 2011, the Proponent must make suitable arrangements to provide appropriate long-term security for the Biodiversity Offset Area (see Appendix 6) to the satisfaction of the Secretary.

Biodiversity Offset Management Plan

29B. By 31 December 2011, the Proponent must prepare a Biodiversity Offset Management Plan to the satisfaction of the Secretary. This plan must:
(a) be generally consistent with OEH's "Principles for the use of biodiversity offsets in NSW";
(b) include:
- a description of the short, medium and long term measures that would be undertaken to implement the Biodiversity Offset Strategy;
- detailed performance and completion criteria for the Biodiversity Offset Strategy; and
- a detailed description of the measures that would be implemented within the Biodiversity Offset Area for:
  - revegetation and regeneration, including (where relevant) establishment of canopy, sub-canopy, understorey and ground cover;
  - appropriate protection, conservation and management of native vegetation and faunal habitat;
  - controlling weeds and feral pests;
  - management of public access; and
  - bushfire management.

The Proponent must implement the Biodiversity Offset Management Plan as approved by the Secretary.

Conservation Bond

29C. Within 6 months of the approval of the Biodiversity Offset Management Plan, the Applicant must lodge a conservation bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Offset Management Plan. The sum of the bond must be determined by:
(a) calculating the full remaining cost of implementing the offset strategy; and
(b) employing a suitably qualified quantity surveyor to verify these costs,
to the satisfaction of the Secretary.

If the Biodiversity Offset Strategy is completed to the satisfaction of the Secretary, the Secretary will release the conservation bond. If the Biodiversity Offset Strategy is not completed to the satisfaction of the Secretary, the Secretary will call in all or part of the conservation bond, and arrange for the satisfactory completion of the relevant works.

Biodiversity Credits

29D. Prior to works commencing for the widening of the haul road and upgrade of the watercourse as described in EA (MOD 4), the Proponent must retire 10 ecosystem credits as listed in the credit profile in Appendix D of EA (MOD 4) in consultation with OEH and in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT and OEH.

***Note**: The listed credits were calculated in accordance with Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and may need to be converted to reasonably equivalent 'biodiversity credits', within the meaning of the BC Act, to facilitate retirement.*

Conservation Funding

30. Within 6 months of the date of this approval, and again prior to 30 September 2011, the Proponent must provide contributions of $20,000 to conservation projects within the Cessnock LGA, in consultation with

OEH and to the satisfaction of the Secretary.

HERITAGE

Aboriginal Cultural Heritage Management Plan

31. The Proponent must prepare an Aboriginal Cultural Heritage Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the OEH and the local Aboriginal community and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) include a protocol for the ongoing consultation and involvement of Aboriginal communities in the conservation and management of Aboriginal heritage on site; and
    (c) describe the measures that would be implemented to protect Aboriginal sites on site, or if any new Aboriginal objects or skeletal remains are discovered during the project.

    The Proponent must implement the Aboriginal Cultural Heritage Management Plan as approved by the Secretary.

Historic Heritage Condition Surveys

31A. Within 2 months of approval of Modification 4, the Proponent must undertake condition surveys of the:
    (a) Buttai No 1 and No 2 reservoirs; and
    (b) Buttai Cemetery (Wilfred Elliot Private Cemetery), including any memorial headstones, graves, fences and trees,
    to the satisfaction of the Secretary.

Historic Heritage Conservation Management Plan

31B. The Proponent must prepare a Historic Heritage Conservation Management Plan for the Buttai No 1 and No 2 reservoirs and the Buttai Cemetery, to the satisfaction of the Secretary: This plan must:
    (a) be prepared by a suitably qualified and experienced person/s;
    (b) be prepared in consultation with OEH, Hunter Water, Council and relevant landowners;
    (c) be prepared in accordance with Heritage Council of NSW guidelines (where relevant);
    (d) outline the results of the condition surveys required under condition 31A of Schedule 3;
    (e) include a program for the regular monitoring of the condition of the No 1 and No 2 reservoirs throughout the life of the project; and
    (f) include a contingency plan in the case of any damage to the No 1 or No 2 reservoirs, or Buttai Cemetery caused by Modification 4.

    The Proponent must implement the Historic Heritage Conservation Management Plan as approved by the Secretary.

VISUAL

32. The Proponent must:
    (a) take all reasonable and feasible measures to mitigate visual and off-site lighting impacts of the project; and
    (b) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*,
    to the satisfaction of the Secretary.

GREENHOUSE GAS

Energy Savings Action Plan

33. The Proponent must prepare an Energy Savings Action Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS, 2005), or its latest version, and be submitted to the Secretary for approval within 6 months of the date of this approval;
    (b) include consideration of energy use by mobile equipment;
    (c) include a program to monitor the effectiveness of measures to reduce energy use on site.

    The Proponent must implement the Energy Savings Action Plan as approved by the Secretary.

WASTE MINIMISATION

34. The Proponent must:

(a) monitor the amount of waste generated by the project;
(b) investigate ways to minimise waste generated by the project;
(c) implement all reasonable and feasible measures to minimise waste generated by the project; and
(d) report on waste management and minimisation in the Annual Review,

to the satisfaction of the Secretary.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. If the results of the monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, except where a negotiated agreement has been entered into in relation to that impact, then the Proponent must, as soon as practicable and no longer than 7 days of obtaining the monitoring results, notify the Secretary, the affected landowners and tenants (including tenants of mine owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in schedule 3 and publish the results on its website.

2. If the results of monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant air quality impact assessment criteria in schedule 3, then the Proponent must send the relevant landowners and tenants (including tenants of mine owned properties) a copy of the NSW Health fact sheet entitled "Mine Dust and You" (and associated updates) in conjunction with the notification required in condition 1.

INDEPENDENT REVIEW

3. If a landowner considers the project to be exceeding the impact assessment criteria in schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the project on his/her land.

   If the Secretary is satisfied that an independent review is warranted, the Proponent must within 2 months of the Secretary's decision:
   (a) consult with the landowner to determine his/her concerns;
   (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to conduct monitoring on the land, to:
      - determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
      - identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and
   (c) give the Secretary and landowner a copy of the independent review.

   If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

4. If the independent review determines that the project is complying with the relevant impact assessment criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Secretary.

   If the independent review determines that the project is not complying with the relevant impact assessment criteria in schedule 3, and that the project is primarily responsible for this non-compliance, then the Proponent must:
   (a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria and conduct further monitoring to determine whether these measures ensure compliance; or
   (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria,
   to the satisfaction of the Secretary.

   If further monitoring under paragraph (a) determines that the project is complying with the relevant criteria, then the Proponent may discontinue the independent review with the approval of the Secretary.

5. If the independent review determines that the relevant impact assessment criteria in schedule 3 are being exceeded, but that more than one mine is responsible for this non-compliance, then the Proponent must, together with the relevant mine/s:
   (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the relevant impact assessment criteria are complied with, and conduct further monitoring to determine whether these measures ensure compliance; or
   (b) secure a written agreement with the landowner and other relevant mines to allow exceedances of the relevant impact assessment criteria in schedule 3,

to the satisfaction of the Secretary.

If the further monitoring referred to under paragraph (a) above determines that the project is complying with the relevant impact assessment criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Secretary.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent must prepare an Environmental Management Strategy for the project, to the satisfaction of the Secretary. The strategy must:
   (a) be submitted to the Secretary for approval within 6 months of the date of this approval;
   (b) provide the strategic framework for environmental management of the project;
   (c) identify the statutory approvals that apply to the project;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
   (e) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the project;
      - respond to any non-compliance; and
      - respond to emergencies;
   (f) include:
      - references to the various strategies, plans and programs that are required under the conditions of this approval once they have been approved; and
      - a clear plan depicting all the monitoring to be carried out in relation to the project.

   The Proponent must implement the Environmental Management Strategy as approved by the Secretary.

Management Plan Requirements

2. The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria;
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the project;
      - effectiveness of any management measures (see (c) above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences;
   (f) a program to investigate and implement ways to continually improve the environmental performance of the project over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

Annual Review

3. Each year, the Proponent must review the environmental performance of the project to the satisfaction of the Secretary. This review must:
   (a) describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the mine complex over the past year, which includes a comparison of these results against the
      - the relevant statutory requirements, limits or performance measures/criteria;

- the monitoring results of previous years; and
- the relevant predictions in the documents listed in condition 2 of Schedule 2;

(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
(d) identify any trends in the monitoring data over the life of the project;
(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
(f) describe what measure will be implemented over the next year to improve the environmental performance of the project.

Revision of Strategies, Plans and Programs

4. Within three months of:
(a) the submission of an annual review under Condition 3 above;
(b) the submission of an incident report under Condition 6 below;
(c) the submission of an audit report under Condition 7 below, or
(d) any modification of the conditions of this approval (unless the conditions require otherwise),
the Proponent must review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

Community Consultative Committee

5. Within 3 months of the date of this approval, the Proponent must establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. The CCC must be operated in general accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects* (2016).

Notes:
- *The CCC is an advisory committee only.*
- *In accordance with the guidelines, the committee should comprise an independent chair and appropriate representation from the Proponent, Council and the local community.*
- *The CCC may also be combined with any similar CCC for the Donaldson Coal Mine or the Abel Coal Mine.*

INCIDENT REPORTING

6. The Proponent must notify the Secretary and any other relevant agencies of any incident associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident.

INDEPENDENT ENVIRONMENTAL AUDIT

7. Every 3 years, unless the Secretary directs otherwise, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
(b) include consultation with the relevant agencies and the CCC;
(c) assess the environmental performance of the project and assess whether it is complying with the requirements in relevant project approvals and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
(d) review the adequacy of strategies, plans or programs required under these approvals; and
(e) recommend appropriate measures or actions to improve the environmental performance of the mine complex, and/or any assessment, plan or program required under these approvals.

Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.

8. Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Secretary, the Proponent must submit a copy of the audit report to the Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Secretary.

Monitoring and Environmental Audits

8A. Any condition of this approval that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.

Note: *For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the project to provide data on compliance with the approval or on the environmental impact of the project, and an "environmental audit" is a periodic or particular documented evaluation of the project to provide information on compliance with the approval or the environmental management or impact of the project.*

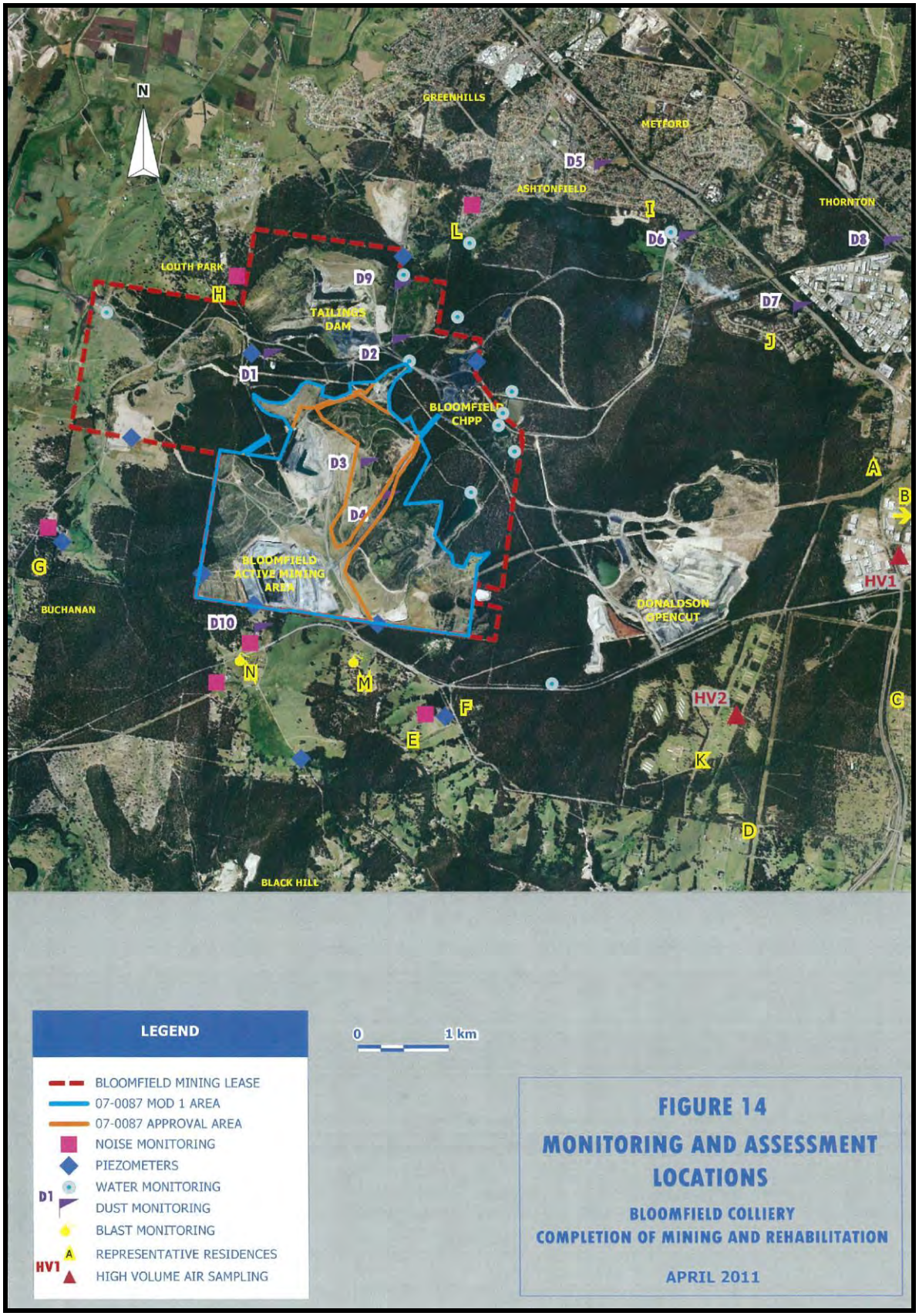
ACCESS TO INFORMATION

9. From the end of 2009, the Proponent must make the following information publicly available on its website:
   (a) a copy of all current statutory approvals for the project;
   (b) a copy of the current environmental management strategy and associated plans and programs;
   (c) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;
   (d) a complaints register, which is to be updated on a monthly basis;
   (e) a copy of the minutes of CCC meetings;
   (f) a copy of any Annual Reviews (over the last 5 years);
   (g) a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and
   (h) any other matter required by the Secretary.

APPENDIX 1
SCHEDULE OF PROJECT LAND

Lot & DP Number	
Lot 36 DP 755260	Lot 1 DP 722210
Lot 35 DP 755260	Lot 26 DP 755260
Lot 34 DP 755260	Lot 25 DP 755260
Lot 48 DP 755260	Part Lot 23 DP 755260
Lot 30 DP 755260	Lot 43 DP 755260
Lot 29 DP 755260	Part Lot 1 DP 1045722
Lot 28 DP 755260	Part Lot 2 DP 1045722
Lot 27 DP 755260	Part Lot 11 DP 755237
Part Lot 26 DP 755260	Lot 13 DP 241097
Part Lot 43 DP 755260	Part Lot 1 DP 136865
Part Lot 25 DP 755260	Lot 1 DP 42349
Part Lot 24 DP 755260	Part Lot 4 DP 241097
Part Lot 18 DP 755237	Part Lot 5 DP 241097
Part Lot 19 DP 755237	Part Lot 6 DP 241097
Part Lot 20 DP 755237	Lot 44 DP 755260
Part Lot 23 DP 755237	Part Lot 45 DP 755260
Part Lot 29 DP 755237	Part Lot 46 DP 755260
Part Lot 13 DP 241097	Part Lot 2 DP 456999
Part Lot 1 DP 136865	Part Lot 10 DP 755237
Part Lot 3 DP 1045720	Part Lot 18 DP 755237
Part Lot 31 DP 755237	Lot 19 DP 755237
Part Lot 4 DP 241097 (Pipeline)	Lot 20 DP 75523
Part Lot 5 DP 241097 (Pipeline)	Lot 23 DP 755237
Part Lot 1 DP 617909 (Pump station)	Part Lot 29 DP 755237
Lot 1 DP 722210 (Road)	Part Lot 1 DP 42349 (Road)
Lot 6 DP 241097 (Pipeline)	Various Council Road Reserves
Crown Road Reserve	Hunter Water Pipeline

APPENDIX 2
PROJECT MAP



APPENDIX 3
STATEMENT OF COMMITMENTS

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
1.	**General**	
1.1	Bloomfield Collieries Pty Limited ('Bloomfield') will carry out the proposed development generally in accordance with this Part 3A Environmental Assessment ('EA'). If there is any inconsistency between this draft Statement of Commitments and the EA, the draft Statement of Commitments will prevail to the extent of the inconsistency.	1.4
1.2	Bloomfield will undertake mining within the Project Area, as defined by Figure 2 of the EA. The Project Area includes the following items and their associated mining activities: ***The current and proposed active open cut coal mining areas;*** ***The unshaped and shaped overburden dump areas within the Project Area;*** ***The workshop and surrounding area used for maintenance and fuel storage;*** ***The road linking the current and proposed coal mining areas with the ROM coal stockpiles adjacent to the coal washery; and*** ***The road linking the current and proposed coal mining areas to the workshop.***	1.1, 2.1
2.	**Production**	
2.1	A maximum of 0.88 mtpa ROM coal will be mined from the Bloomfield Mine during Stage 1 with a maximum of 1.3 mtpa ROM coal mined during Stages 2 to 4.	2.5
2.2	Active mining will occur over 4 stages, which total approximately 10 to 21 years. The final (5th) stage is the completion of site rehabilitation.	2.5
2.3	All Run-of-Mine ('ROM') coal will be transported by internal haul roads to the approved ROM coal stockpiles at the Bloomfield washery.	2.6.1
3.	**Hours of Operation**	
3.1	Bloomfield Mine will operate 24 hours per day, seven days per week.	2.4
4.	**Rehabilitation**	
4.1	All site rehabilitation, including monitoring and maintenance will be undertaken in accordance with procedures documented in the EA and the existing Bloomfield Rehabilitation Management System.	3.2
4.2	Any additional rehabilitation requirements and plans for this Project will be included in the existing Bloomfield Rehabilitation Management System.	3.2
4.3	Land that has been mined will be rehabilitated to a safe and stable form with a land capability similar to that existing prior to mining, and with a landform compatible with the surrounding landscape.	3.3.2
4.4	Post mining landform and land use plans will be developed in consultation with the landowner and with reference to the objectives of the Lower Hunter Regional Strategy (the Department, 2006).	3.6.1

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
5.	**Final Void**	
5.1	The final void will be retained for the deposition of washery reject material in accordance with the Abel Project Approval.	3.5
5.2	Rehabilitation of the final void forms part of the Abel Project Approval. However, rehabilitation of the tailings filled void at the completion of the Abel Project will remain the responsibility of Bloomfield as outlined in the Draft Bloomfield Closure and Rehabilitation Strategy (Abel).	Letter to the Department (11/5/09)
6.	**Environmental Management Systems and Plans**	
6.1	Bloomfield's existing environmental management systems, plans and procedures will be applied to this Project and will be amended where relevant to incorporate additional items required to manage, mitigate, or monitor impacts associated with this Project.	2.8, 2.11, 3.2
7.	**Environmental Monitoring and Reporting**	
7.1	Bloomfield will undertake ongoing environmental monitoring as detailed in this EA.	2.8
7.2	Bloomfield will implement and participate in the actions required for the Integrated Environmental Monitoring Program ('IEMP') that forms part of the Abel Project Approval and which includes elements of the Bloomfield Project.	2.8, 2.12, 15.2
7.3	An Annual Environmental Management Report ('Annual Review') will be prepared and forwarded to relevant government departments, including the Department. The Annual Review will include a summary of all monitoring undertaken during the year, including a discussion of any exceedances and responses taken to ameliorate these exceedances.	4.3.2
8.	**Consultation**	
8.1	Bloomfield will continue to consult with the local community throughout the life of the Project.	5
8.2	A specific representative of Bloomfield will be nominated and contact details provided so that members of the community may contact the mine with questions or complaints if required.	5
8.3	A record of any complaints received regarding the Project will be retained by Bloomfield for the duration of the Project.	2.8
9.	**Flora and Fauna**	
9.1	A Flora and Fauna Management Plan will be developed and implemented prior to any clearing occurring as part of the Project.	7.6
9.2	The existing Bloomfield pre-clearance protocol will be implemented prior to any clearing occurring as part of the Project.	7.6, 7.7
9.3	Bloomfield will commit to commensurate support to the value of $20,000 for a local activity or program related to biodiversity, to be commenced within the first two years of mining.	7.6, 7.7, Response to Submissions (29/1/09) and DECC meeting minutes (30/4/09)
10.	**Aboriginal Heritage**	

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
10.1	An Aboriginal Heritage Management Plan ('AHMP') will be prepared in consultation with Mindaribba LALC~~,~~ prior to any Project impacts occurring. This Plan will specify the policies and actions required to mitigate and manage the potential impacts of the Project on Aboriginal heritage. The plan will include: ***Procedures for ongoing Aboriginal consultation and involvement;*** ***Mitigation measures for the identified and potential Aboriginal evidence;*** ***Management procedures for any previously unrecorded evidence or skeletal remains;*** ***Training for relevant staff and contractors in their roles and responsibilities under the AHMP*** ***Review of the plan.***	8.8
10.2	The AHMP will include a program of salvage to be undertaken in the Project Area with representatives of Mindaribba LALC collecting identified stone artefacts from sites B2, B16, B18, B19, B20 and B22 prior to any development impacts occurring.	8.8
10.3	Should any skeletal remains be detected during the Project, work in that location will cease immediately and the finds will be reported to the appropriate authorities, including the Police, OEH and Mindaribba LALC.	8.8
10.4	In the event that Aboriginal objects are located during the Project, a protocol to ascertain the value of such finds, in consultation with the Aboriginal community representatives and a qualified archaeologist will be implemented and used to inform any management decision. OEH will be informed of any finds using the appropriate site recording cards.	8.8
10.5	Further consultation with and continued involvement of Mindaribba LALC will be continued through the Project, in relation to the contents and recommendations of Aboriginal Heritage studies.	8.8
11.	**Noise Management and Monitoring**	
11.1	A Noise Management Plan will be prepared and implemented for the Project. The Plan will include mitigation and monitoring requirements for the Project.	9.2
11.2	The following noise controls will be implemented to achieve noise criteria identified in this EA: During Year 1 (End of Stage 1): ***The excavator and dump site will be situated in a shielded location during night-time operation;*** ***No dozer operation at the drill location will occur during night~~-~~and morning shoulder periods; and*** ***The front end loader will replace the dozer at the dump site during the night-time period unless 4 dBA of noise suppression is achieved.*** During Year 5 (End of Stage 2): ***The excavator and dump site will be situated in a shielded location during night-time operation;*** ***No dozer operation at the drill location will occur during night and morning shoulder periods; and*** ***The front end loader will replace the dozer at the dump site during the night-time period unless 4 dBA of noise suppression is achieved.*** During Year 10 (End of Stage 4): ***The excavator and dump site will be situated in a shielded location during night-time operation; and***	9.5

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
	No dozer operation at the drill location will occur during the night period.	
11.3	Bloomfield may undertake a noise monitoring and investigation program during the Project, in consultation with OEH and the Department, to determine whether relevant noise criteria can be achieved without the use of the noise controls listed in 11.2. If such a study concludes that relevant criteria can be achieved, the above controls will be modified or removed.	9.5
11.4	Noise complaints received will be dealt with in accordance with Bloomfield's existing complaints protocol.	2.8
12.	**Blasting**	
12.1	Bloomfield will continue to consult with nearby residents regarding their blasting program, consistent with current practice and the Shot Firing and Explosives Management Plan.	2.8
12.2	Blasting will only be undertaken during the hours of 9.00 am to 5.00 pm Monday to Saturday. Blasting will not occur on Sundays or Public Holidays.	9.8
12.3	Blasts will be designed in consideration of vibration and airblast limits, wind speed and direction.	9.8
12.4	Blast monitoring will be conducted over the life of the mine in accordance with requirements provided by the Shot Firing and Explosives Management Plan.	2.8
12.5	All relevant personnel will be trained in Bloomfield's environmental obligations in relation to blasting controls.	2.8
13.	**Air Quality**	
13.1	An Air Quality Monitoring Program will be prepared and implemented for the Project. The Air Quality Monitoring Program will include monitoring at locations as described in the EA.	2.12
13.2	Dust generation on the Project Area will be minimised by implementation of the following: ***All vehicles will be operated according to Mine Transport Management Plan, which requires vehicles to remain on specified routes;*** ***Disturbed areas will be minimised where possible;*** ***Dust suppression water spraying will be used on all active haul roads and stockpile areas where required;*** ***All mobile equipment will be maintained in good working order;*** ***Adequate stemming will be used in blast holes; and*** ***Meteorological conditions will be considered in the timing of blasts to minimise impacts of blast generated dust.***	2.8
14.	**Greenhouse Gas Monitoring and Energy Efficiency**	
14.1	Bloomfield will assess the viability of improving energy efficiency and reducing greenhouse gas emissions from its operations, including the mining fleet, stationary equipment and mining processes.	10.9
14.2	Bloomfield will monitor greenhouse gas emissions in accordance with the requirements of the current EEO and Greenhouse Challenge Plus programs and comply with any reporting requirements under the *NGER Act 2007*.	10.9

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
15.	**Surface Water Management**	
15.1	Surface water management for the Project will be undertaken in accordance with Bloomfield's existing Environmental Water Management System ('EWMS'). The EMWS will be modified to address the additional requirements for this Project provided in the Draft Water Management Plan (**Appendix H**).	2.8, 11.5
15.2	An Erosion and Sediment Control Plan will be prepared that will form part of the EWMS.	2.8, 11.3, 11.5
16.	**Surface Water Monitoring Program**	
16.1	Bloomfield's existing EWMS incorporates a Surface Water Monitoring Program which will be implemented for this Project and updated to include the additional monitoring point proposed for this Project in consultation with DoI.	11.5.2
16.2	A response/mitigation procedure will be developed as part of the EWMS for unforeseen surface or groundwater impacts being detected during the Project.	11.5.3, 12.4
17.	**Groundwater Monitoring**	
17.1	Bloomfield's existing EWMS will incorporate a Groundwater Monitoring Program, developed in consultation with DoI.	2.8, 12.4
18.	**Visual Amenity**	
18.1	Visual impacts of the Bloomfield Mine will be mitigated by the following strategies: ***Rehabilitation of the southern boundary of the Project Area adjacent to John Renshaw Drive will be given priority during the early stages of mining;*** ***Mobile directional lighting in active mine areas will be directed away from neighbouring properties and roadways; and*** ***Complaints regarding lighting will be investigated by Bloomfield during the relevant shift.***	14.6.1, 14.6.2
18.2	Tree areas will be incorporated into rehabilitation to assist the visual blending of overburden dumps with the surrounding landscape.	3.4.3
19.	**Staff Training**	
19.1	Bloomfield will ensure that all personnel receive training in their responsibilities to mitigate, manage and monitor potential environmental impacts.	2.8, 2.11, 3.2
20.	**Integration with Other Mining Operations – Roles & Responsibilities**	
20.1	Bloomfield will implement and participate in the actions required for the Integrated Environmental Monitoring Program ('IEMP') that forms part of the Abel Project Approval and which includes elements of the Bloomfield Project.	2.8, 2.12, 15.2
20.2	Bloomfield is responsible for the operation, maintenance and monitoring of all water management systems and structures within its Project Area.	15.3.2 Letter to the Department (11/5/09)
20.3	Rehabilitation of the final void forms part of the Abel Project Approval. However, rehabilitation of the tailings filled void at the completion of	Letter to the Department

REF.	COMMITMENT	EA SECTION No. (Refer for further detail)
	the Abel Project will remain the responsibility of Bloomfield as outlined in the Draft Bloomfield Closure and Rehabilitation Strategy (Abel).	(11/5/09)
21.	**Community Enhancement Fund**	
21.1	Bloomfield will establish a Community Enhancement Fund (CEF) that will provide a range of practical commitments to local community projects and contributions to the local community.	Response to Submissions (29/1/09) and email to the Department (7/5/09)
21.2	The CEF will comprise two components: ***Within two years of the Bloomfield Mine being approved, $180,000 will be provided by Bloomfield for a local infrastructure project within Cessnock Local Government Area, to be determined in consultation with Cessnock City Council.*** • Over a period of ten years from the date of the Bloomfield Mine being approved, $320,000 will be provided by Bloomfield for a community welfare based charity/s focussed within the Cessnock LGA, to be determined in consultation with Cessnock City Council.	Email to the Department (7/5/09)

REF.	COMMITMENTS FOR THE PROPOSED S75W MODIFICATION (07_0087 MOD 1)	S75W Modification EA Section
1.	**General**	
1.1	Bloomfield Collieries will carry out the proposed development generally in accordance with the Section 75W Environmental Assessment ('EA') and the Part3A Environmental Assessment (07_0087). If there is any inconsistency between this draft Statement of Commitments and the EA, the Statement of Commitments will prevail to the extent of the inconsistency.	1.4
1.2	Bloomfield will undertake mining and rehabilitation activities within the Project Area as defined by the Schedule of Land (Figure 8). The proposed Modification Activities include: • ***Upgrade and use of Wattle Tree Drive as an alternative haul route (Area A);*** • ***Additional overburden emplacement and rehabilitation - east of Save a Mile Haul Road (Area B)*** • ***Additional out-of-pit landform reshaping and rehabilitation – northern and south-eastern areas (Area C and E)*** • ***Construction of a corridor and overhead powerline from an existing powerline onto the open cut mine site, together with some clearing for an associated infrastructure area (Area D)***	1.1, Chapter 2

2.	**Hours of Operation and Operational Controls**	
2.1	Bloomfield Mine will operate 24 hours per day seven days per week except for the proposed Modification Activities. No Modification Activities will occur during the night-time period (10.00pm-6.00am). To manage noise from the various Modification Activities the following hours of operation will be followed: • ***Wattle Tree Drive construction (Area A) and Powerline Corridor (Area D)*** o ***Construction hours (for the powerline corridor and construction of Wattle Tree Drive) will between the hours of 7.00am and 6.00pm Monday to Friday and 8.00am to 1.00pm Saturdays.*** o ***A bund will be constructed adjacent to Wattle Tree Drive and trees will be planted to screen this area, thereby minimising aesthetic impacts and stray light.*** • ***East of Save-a-Mile haul road (Area B)*** o ***Daytime operations (7.00am to 6.00pm Mondays to Saturdays, 8.00am to 6.00pm Sundays) will be in the southern part of the dump to raise the dump and provide screening for the evening (6.00pm-10.00pm) and morning shoulder (6.00am-7.00am) operations.*** o ***The height of the overburden emplacement area will be limited to an RL of 100 metres*** o ***During evening and morning shoulder periods, the following controls will be in place:*** ▪ ***the drill and clearing dozer will be worked in a shielded location; dumping will only occur in the northern part of the dump;*** ▪ ***the dozer will only operate in a shielded location in the northern part of the dump;*** ▪ ***an earthern bund will be constructed in the approved dumping area to the south of the existing haul road to a minimum height of 80 metres RL; and*** ▪ ***There will be no coal haulage from S-Cut during the morning shoulder period.*** • ***Northern area (Area C)*** o ***Dumping and rehabilitation during the daytime period only.*** • ***South-eastern area (Area E)*** o ***Dumping and rehabilitation during the daytime period only (7.00am to 6.00pm Mondays to***	6.6

	Saturdays, 8.00am to 6.00pm Sundays) o ***Dumping will be restricted to a maximum of 70 hours of work; and*** o ***A front end loader will replace the dozer at the Area E dump once the emplacement reaches an RL of 52 metres.***	
3.	**Ecology**	
3.1	A pre-clearing protocol to protect any threatened species using trees within the powerline clearing area will be implemented during construction of the corridor.	6.3
3.2	The identified nesting tree adjacent to the powerline clearing area will be protected during construction of the powerline and associated infrastructure to prevent accidental damage by machinery.	6.3
3.3	Bloomfield will commit to providing a biological offset to compensate for the loss of native vegetation. The offset will be agreed with and designed to satisfy the requirements of the Department of Planning and Infrastructure and generally be consistent with OEH's "Principles for the use of biodiversity offsets in NSW".	
3.4	Bloomfield will commit to providing $20,000 towards the Stanford Merthyr Conservation Project being managed by the Land and Property Management Group within 6 months of Director General's approval of the modification.	
4.	**Water Management**	
4.1	The existing water drainage channel to Lake Kennerson will be re-routed around the disturbance area prior to commencement of works in the south-eastern area	6.9.1
4.2	Diversion banks and sediment control measures will be provided at the toe of the proposed batter of the emplacement area adjacent to Save-a-Mile haul road prior to works commencing to protect downstream areas	6.9.1

APPENDIX 4
CONCEPTUAL FINAL LANDFORM

Figure 1: *Proposed final landform – Abel Underground Mine in care and Maintenance*

Figure 2: *Proposed final landform – Abel Underground Mine resumes operation*

APPENDIX 5

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APPENDIX 6
BIODIVERSITY OFFSET AREA

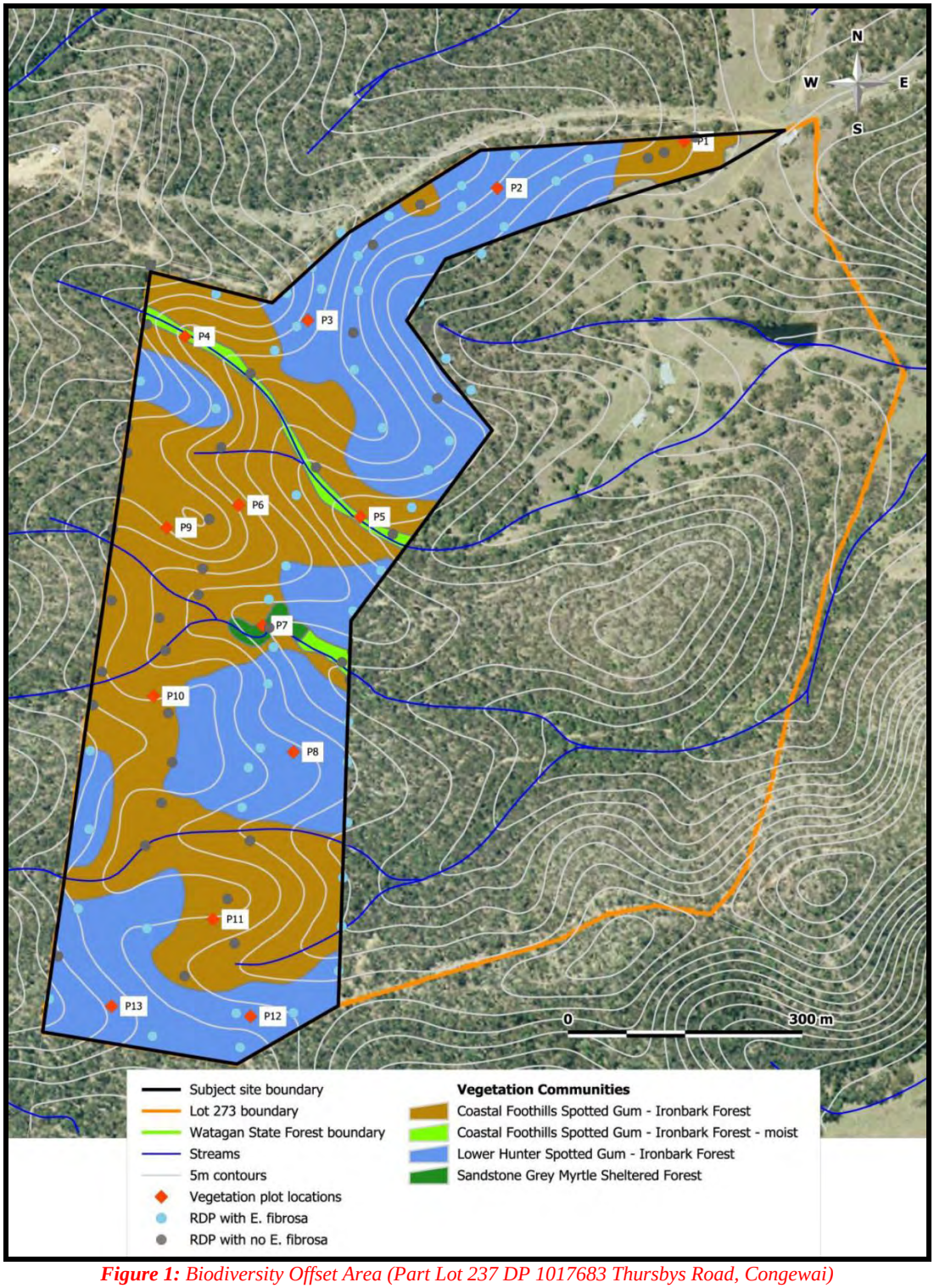

Figure 1: *Biodiversity Offset Area (Part Lot 237 DP 1017683 Thursbys Road, Congewai)*

APPENDIX 2

RISK REGISTER

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

Process Area	Activity	Aspect	Raw (potential risk) C	P		R	Existing Controls	Existing Controls C	P		R	Proposed Controls	Residual Risk C	P		R
Exploration	Survey of the drill locations	Damage to vegetation	5	c	5c	22 (L)	1. Employee Inductions 2. Experienced people 3. Use of existing tracks where possible	5	d	5d	24 (L)					
		Disturbance of Aboriginal heritage	2	d	2d	12 (M)		2	d	2d	12 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. Aboriginal Groups have been consulted 4. All known artefacts have been fenced off 5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining. 6. Aboriginal Heritage Management System.	2	e	2e	16 (L)
		Disturbance of European heritage	2	d	2d	12 (M)		2	d	2d	12 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. No heritage items have been identified.	5	e	5e	25 (L)
		Wheel track erosion	3	d	3d	17 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Scheduled Environmental Inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing Sediment Control Dams	4	e	4e	23 (L)					
		Fire hazard	3	d	3d	17 (L)	1. Employee Inductions 2. Hazard reduction program 3. Competent employees 4. Bushfire Management Plan 5. Onsite fire fighting capabilities	4	d	4d	21 (L)					
		Dust	3	d	3d	17 (L)	1. Employee Inductions 2. Land Disturbance Management System (dust) 3. Water cart availability 4. Complaints Protocol 5. Mindful of weather (wind) conditions.	5	e	5e	25 (L)					
		Potential for spills of hydrocarbons from vehicle accident.	4	d	4d	21 (L)	1. Mine Transport Management Plan 2. Bushfire Management Plan 3. Scheduled Environmental Inspections 4. Contractor Management System 5. Incident Notification and Reporting Procedure 6. Emergency Response Procedure	4	e	4e	23 (L)					
		Injury to or loss of threatened flora and fauna *(note work area mostly cleared)*	4	d	4d	21 (L)	1. Mine Transport Management Plan 2. Employee Inductions 3. Daylight operations	4	e	4e	23 (L)					
		Potential to introduce weeds	5	e	5e	25 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Scheduled Environmental Inspections 4. Weed Control Contractors	5	e	5e	25 (L)	not considered an issue				
	Clearing of drill lines and Site establishment and Digging Pits	Injury to or loss of threatened flora and fauna *(note work area mostly cleared)*	4	c	4c	18 (L)	1. Mine Transport Management Plan 2. Employee Inductions 3. Daylight operations	4	d	4d	21 (L)					
		Sediment leaving the site	3	c	3c	13 (M)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Scheduled Environmental Inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing sedimentation dam on boundary	4	d	4d	21 (L)					
		Loss of top dressing material	4	c	4c	18 (L)	1. Mining Operations Plan 2. Minimal surface disturbance	4	d	4d	21 (L)					
		Disturbance of Aboriginal heritage	2	c	2c	8 (M)	1. Non existent in area under investigation	2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. Aboriginal Groups have been consulted 4. All known artefacts have been fenced off 5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining. 6. Aboriginal Heritage Management System.	2	e	2e	16 (L)
		Disturbance of European heritage	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. No heritage items have been identified.	5	e	5e	25 (L)
		Potential to introduce weeds	5	e	5e	25 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Scheduled Environmental Inspections 4. Weed Control Contractors	5	e	5e	25 (L)	not considered an issue				
		Noise	4	d	4d	21 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints Protocol	4	e	4e	23 (L)					
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections	5	e	5e	25 (L)					
		Fire hazard	3	d	3d	17 (L)	1. Employee Inductions 2. Hazard reduction program 3. Competent employees 4. Bushfire Management Plan 5. Onsite fire fighting capabilities	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

Process Area	Activity	Aspect	Raw (potential risk) C	P		R	Existing Controls	Existing Controls C	P		R	Proposed Controls	Residual Risk C	P		R
		Hydraulic hose oil spill	3	c	3c	13 (M)	1. Maintenance Management System 2. Environmental Emergency Response Procedure 3. Spill kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure	4	d	4d	21 (L)					
	Establish drill rig and drilling (including demobilisation)	Erosion with sediment leaving site (wheel tracks)	4	d	4d	21 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Scheduled Environmental Inspections 4. Systems audits 5. Environmental Protection Licence 6. Existing sedimentation dam on boundary 7. Contractor Management System 8. Contractor Inductions	5	d	5d	24 (L)					
		Hydrocarbon storage	3	c	3c	13 (M)	1. Mobile equipment 2. Contract Management System 3. Contractor Induction 4. Onsite spill kits 5. Bushfire Management Plan 6. Supervisor Inspections 7. Incident Notification and Reporting Procedure	4	d	4d	21 (L)					
		Potential to introduce weeds	4	c	4c	18 (L)	1. Vehicle wash at entrance 2. Contractor inductions 3. Scheduled Environmental Inspections 4. Weed Control Contractors 5. Supervisor Inspections	4	d	4d	21 (L)					
		Injury to or loss of threatened flora and fauna *(note work area mostly cleared)*	5	e	5e	25 (L)	1. Mine Transport Management Plan 2. Employee Inductions 3. Daylight operations	5	e	5e	25 (L)	not considered an issue				
		Hydraulic hose oil spill	3	c	3c	13 (M)	1. Mobile equipment 2. Contract Management System 3. Contractor Induction 4. Onsite spill kits 5. Bushfire Management Plan 6. Supervisor Inspections 7. Incident Notification and Reporting Procedure	4	d	4d	21 (L)					
		Spillage of hydrocarbons during transfer from the service truck.	3	c	3c	13 (M)	1. Mobile equipment 2. Contractor Management System 3. Contractor Induction 4. Onsite spill kits 5. Bushfire Management Plan 6. Incident Notification and Reporting Procedure	4	d	4d	21 (L)					
		Hydrocarbon leaking from tank	3	c	3c	13 (M)	1. Mobile equipment 2. Contractor Management System 3. Contractor Induction 4. Onsite spill kits 5. Bushfire Management Plan	4	d	4d	21 (L)					
		Noise	4	c	4c	18 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints Protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions	4	d	4d	21 (L)					
		Dust	3	c	3c	13 (M)	1. Employee Inductions 2. Land Disturbance Management System (dust) 3. Water cart availability 4. Complaints Protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions 8. Mindful of weather (wind) conditions.	3	d	3d	17 (L)					
		Fire hazard	4	d	4d	21 (L)	1. Hazard reduction program 2. Bushfire Management Plan 3. Onsite fire fighting capabilities 4. Supervisor Inspections	5	d	5d	24 (L)					
		Waste management e.g. oily rags, empty drums	4	b	4b	14 (M)	1. Contractor Management System 2. Contractor Induction 3. Onsite waste bins 4. Supervisor Inspections	5	d	5d	24 (L)					
	Traffic movement e.g. water cart, geologist, driller, logger	Potential to introduce weeds	4	d	4d	21 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Scheduled Scheduled Environmental Inspections 4. Weed Control Contractors	5	d	5d	24 (L)					
		Wheel track erosion	4	b	4b	14 (M)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Scheduled Environmental Inspections 4. Systems audits 5. Environmental Protection Licence 6. Contractor Management System 7. Supervisor Inspections 8. Contractor Induction	4	d	4d	21 (L)					
		Fire hazard	4	d	4d	21 (L)	1. Hazard reduction program 2. Bushfire Management Plan 3. Onsite fire fighting capabilities 4. Supervisor Inspections 5. Contractor Management System 6. Contractor Induction	5	d	5d	24 (L)					
		Noise	4	c	4c	18 (L)	1. Daylight activity 2. Employee Induction 3. Maintenance Management System 4. Complaints Protocol 5. Supervisor Inspections 6. Contractor Management System 7. Contractor Induction	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - EXPLORATION

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Dust	3	c	3c	13 (M)	1. Employee Induction 2. Land Disturbance Management System (dust) 3. Water cart availability 4. Complaints Protocol 5. Supervisor Inspections 6. Contractor Management System 7. Contractor Induction 8. Mindful of weather (wind) conditions.	4	d	4d	21 (L)					
		Potential for spills of hydrocarbons from vehicle accident.	4	d	4d	21 (L)	1. Mine Transport Management Plan 2. Bushfire Management Plan 3. Scheduled Environmental Inspections 4. Incident Notification and Reporting Procedure 5. Contractor Management System 6. Contractor Induction 7. Incident Notification and Reporting Procedure	4	e	4e	23 (L)					
		Injury to or loss of threatened flora and fauna *(note work area mostly cleared)*	5	e	5e	25 (L)	1. Mine Transport Management Plan 2. Employee Inductions 3. Daylight operations	5	e	5e	25 (L)	not considered an issue				
		Loss of radiation source	4	d	4d	21 (L)	1. Contractor Management System 2. Contractor Induction 3. Use of NATA approved contractor	4	e	4e	23 (L)					
	Open holes and pits after drilling	Injury to or loss of threatened flora and fauna *(note work area mostly cleared)*	4	d	4d	21 (L)	1. Fill in pits and cap holes 2. DPI guidelines 3. Mining Lease Conditions	5	e	5e	25 (L)	not considered an issue				
		Aquifer contamination	4	d	4d	21 (L)	1. Dry area 2. Capping holes 3. Deep hard rock aquifer 4. No alluvial aquifers involved 5. Poor water quality	5	e	5e	25 (L)	not considered an issue				
	Rehabilitation	Potential to introduce weeds	4	c	4c	18 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Scheduled Environmental Inspections 4. Weed Control Contractors	4	d	4d	21 (L)					
		Erosion with sediment leaving site	4	d	4d	21 (L)	1. Use existing tracks where possible 2. Draft Erosion & Sediment Control Management Plan 3. Scheduled Environmental Inspections 4. Systems audits 5. Licence 6. Existing sedimentation dam on boundary	5	d	5d	24 (L)					
		Noise	4	d	4d	21 (L)	1. Daylight activity 2. Employee Inductions 3. Maintenance Management System 4. Complaints Protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions	4	e	4e	23 (L)					
		Dust	3	c	3c	13 (M)	1. Employee Inductions 2. Land Disturbance Management System (dust) 3. Water cart availability 4. Complaints Protocol 5. Supervisor Inspections 6. Contractors Management Systems 7. Contractor Inductions 8. Mindful of weather (wind) conditions	5	e	5e	25 (L)					
		Hydraulic hose oil spill	4	d	4d	21 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. Spill kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure	5	d	5d	24 (L)					
		Fire hazard	4	d	4d	21 (L)	1. Inductions 2. Hazard reduction program 3. Competent employees 4. Bushfire Management Plan 5. Onsite fire fighting capabilities	5	d	5d	24 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
Pre-stripping	Clearing of vegetation - *note: site predominantly cleared*	Injury to or loss of threatened flora and fauna	2	b	2b	5 (H)	1. Draft Land Disturbance Management System 2. Work area mostly cleared.	3	d	3d	17 (L)	1. Assessment has been made on the presence / absence of threatened species 2. No threatened species were identified within the area to be disturbed 3. A relevant DECC approved research program will be committed to by Bloomfield commensurate to the loss of any Lower Hunter Spotted Gum Ironbark Forest Endangered Ecological Community within the Project area.	3	d	3d	17 (L)
		Disturbance of Aboriginal heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. Aboriginal Groups have been consulted 4. All known artefacts have been fenced off 5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining. 6. Aboriginal Heritage Management System.	2	e	2e	16 (L)
		Disturbance of European heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. No heritage items have been identified.	5	e	5e	25 (L)
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Noise	4	d	4d	21 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered operating conditions at set times (ie. night time) to reduce noise.	4	e	4e	23 (L)					
		Erosion with sediment leaving site	4	c	4c	18 (L)	1. Employee Inductions 2. Internal drainage 3. Existing Sediment Control Dam 4. Draft Erosion & Sediment Control Plan 5. Mining Operations Inspection System 6. Scheduled Environmental Inspections	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	5	d	5d	24 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk) C	P	R		Existing Controls	Existing Controls C	P	R		Proposed Controls	Residual Risk C	P	R	
		Potential to introduce weeds	4	d	4d	21 (L)	1. Weed Control Contractors 2. Scheduled Environmental Inspections 3. Vehicle wash at entrance 4. Employee Inductions 5. Employee Consultation Systems 6. Contractor Induction 7. Supervisor Inspections 8. Supervisor Audits 9. Contractor Management System	5	d	5d	24 (L)					
		Disposal of cleared timber (potential loss of habitat)	3	b	3b	9 (M)	1. Pre-clearance protocol	4	e	4e	23 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Mobile equipment 8. Competency Management System	4	d	4d	21 (L)					
	Stripping of Top-dressing Material	Disturbance of Aboriginal heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. Aboriginal Groups have been consulted 4. All known artefacts have been fenced off 5. The sites will be salvaged with the Aboriginal Community prior to the area being disturbed by mining. 6. Aboriginal Heritage Management System.	2	e	2e	16 (L)
		Potential to introduce weeds	4	d	4d	21 (L)	1. Vehicle wash at entrance 2. Employee inductions 3. Scheduled Environmental Inspections 4. Weed Control Contractors 5. Contractor Management System 6. Contractor Inductions	5	d	5d	24 (L)					
		Disturbance of European heritage sites	2	c	2c	8 (M)		2	c	2c	8 (M)	1. Employee Inductions 2. Surveys completed to identify sites and assess significance. 3. No heritage items have been identified.	5	e	5e	25 (L)
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	3	d	3d	17 (L)					
		Noise	4	b	4b	14 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered Operating Conditions at set times (ie night time) to reduce noise.	4	e	4e	23 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk) C	P	R		Existing Controls	Existing Controls C	P	R		Proposed Controls	Residual Risk C	P	R	
		Erosion with sediment leaving site	3	b	3b	9 (M)	1. Employee Inductions 2. Internal drainage for part of the area 3. Existing Sediment Control Dam 4. Draft Erosion & Sediment Control Plan 5. Mining Operations Inspection System 6. Scheduled Environmental Inspections	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Mine Transport	5	d	5d	24 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Loss of top dressing material	3	b	3b	9 (M)	1. Mining Operations Plan 2. Employee awareness and supervision 3. Employee consultation system 4. Scheduled Environmental Inspections 5. Competency Management System	4	d	4d	21 (L)					
		Quality of top dressing material reduced through damage to soil structure	4	c	4c	18 (L)	1. Direct placement wherever possible 2. Top dressing material stockpile management 3. Mining Operations Plan 4. Employee awareness and supervision 5. Employee consultation system 6. Scheduled Environmental Inspections 7. Competency Management System	4	e	4e	23 (L)					
	Overburden drilling	Noise	3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered operating conditions at set times (ie. night time) to reduce noise.	3	d	3d	17 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk) C	P	R		Existing Controls	Existing Controls C	P	R		Proposed Controls	Residual Risk C	P	R	
		Dust	3	c	3c	13 (M)	1. Dust Extraction Systems 2. Curtains and water on drill 3. Employee Inductions 2. Land Disturbance Management System (dust) 3. Water cart availability 4. Complaints Protocol 7. Supervisor Inspections 8. Supervisor Audits 9. Mindful of weather (wind) conditions	4	d	4d	21 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Mine Transport Management Plan	5	d	5d	24 (L)					
	Blasting	Noise/ overpressure	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	3	d	3d	17 (L)					
		Vibration	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	4	d	4d	21 (L)					
		Dust	3	b	3b	9 (M)	1. Shot Firing and Explosives Management System 2. Access to external specialist input 3. Inductions 4. Land Disturbance Management System (dust) 5. Water cart availability 6. Complaints Protocol 7. Supervisor Inspections 8. Supervisor Audits 9. Mindful of weather (wind) conditions	4	c	4c	18 (L)					
		Noxious gas released to atmosphere *(unusual to experience wet holes in pre-strip)*	4	d	4d	21 (L)	1. Shot Firing and Explosives Management System 2. Access to external specialist input	5	e	5e	25 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk) C	P	R		Existing Controls	Existing Controls C	P	R		Proposed Controls	Residual Risk C	P	R	
	Excavation of overburden (using the excavator)	Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered operating conditions at set times (ie. night time) to reduce noise.	3	d	3d	17 (L)					
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Visual	3	c	3c	13 (M)	1. Progressive Rehabilitation 2. Mine Planning 3. Timber screening 4. Informal Operational procedures (night lighting) 5. Community Consultation 6. Complaints Protocol	3	d	3d	17 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	5	d	5d	24 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Taking coal with overburden (sponcom in rehabilitation)	4	e	4e	23 (L)	1. Burial of oxidised coal material 2. Supervisor Audits 3. Mining Operation Plan 4. Supervisor Inspections 5. Mining Operations Inspection Management System	5	e	5e	25 (L)	not considered an issue				
		Waste Management (during service days)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Maintenance	5	d	5d	24 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Major shut downs (contractor)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Supervisor Audits	5	d	5d	24 (L)					
	Mining of coal	Noise	3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered operating conditions at set times (ie. night time) to reduce noise.	3	d	3d	17 (L)					
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Competency Management System	4	d	4d	21 (L)					
	Hauling with rear dump trucks	Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered operating conditions at set times (ie. night time) to reduce noise.	3	d	3d	17 (L)					
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Emergency Response Procedure	5	d	5d	24 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk) C	P	R		Existing Controls	Existing Controls C	P	R		Proposed Controls	Residual Risk C	P	R	
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections 5. Supervisor Audits	4	e	4e	23 (L)					
	Hauling with on-highway trucks	Noise	3	c	3c	13 (M)	1. Contractor Management System 2. Engineer's Audits 3. RTA registered trucks 4. Six monthly shaker tests 5. Maintenance Management Systems 6. Complaints Protocol 7. Supervisor Inspections 8. Contractor Induction 9. Altered operating conditions at set times (ie. night time) to reduce noise.	3	d	3d	17 (L)					
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Contractor Management System 8. Contractor Induction 9. Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Contractor Management System 2. Emergency Spill Response 3. On-site On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)					
		Spillage of hydrocarbons when transferring from service truck	4	b	4b	14 (M)	1. Contractor Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Employee Consultation Systems 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Contractor Induction	4	d	4d	21 (L)					
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Supervisor Audits 3. Defect Management System 4. Supervisor Inspections 5. Contractor Management System	4	e	4e	23 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - PRE-STRIPPING

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
	Overburden dumping area (includes tipping with trucks)	Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits	3	d	3d	17 (L)					
		Lighting of the dumps being directed into the residents houses resulting in visual impact issues.	4	b	4b	14 (M)	1. Direction of lights are changed so that they are not pointed towards the residents 2. Opportunity to enable dumping in an alternative dump or location on the dump after dark.	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
Main Dig	Interburden drilling	Noise	3	d	3d	17 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	e	3e	20 (L)					
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections	4	d	4d	21 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	5	d	5d	24 (L)					
	Blasting	Noise/ overpressure	2	c	2c	8 (M)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol 8. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	d	3d	17 (L)					
		Vibration	2	b	2b	5 (H)	1. Shot Firing and Explosives Management System 2. Competent, experienced employees 3. Inhouse Mining Engineer 4. Access to external specialist input 5. Supervisor Inspections 6. Supervisor Audits 7. Complaints Protocol	4	d	4d	21 (L)					
		Dust	3	c	3c	13 (M)	1. Shot Firing and Explosives Management System 2. Access to external specialist input 3. Inductions 4. Land Disturbance Management System (dust) 5. Water cart availability 6. Complaints Protocol 7. Supervisor Inspections 8. Mindful of weather (wind) conditions	4	d	4d	21 (L)					
		Noxious gas released to atmosphere *(unusual to experience wet holes in pre-strip)*	4	d	4d	21 (L)	1. Shot Firing and Explosives Management System 2. Access to external specialist input	5	e	5e	25 (L)					
	Excavation of interburden	Noise	3	c	3c	13 (M)	1. Maintenance Management System 2. Competent, experienced employees 3. Supervisor Inspections 4. Supervisor Audits 5. Complaints Protocol 6. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	d	3d	17 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Incident Notification and Reporting Procedure 6. Supervisor Inspections 7. Supervisor Audits	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Taking coal with overburden (sponcom in rehabilitation)	4	d	4d	21 (L)	1. Burial of oxidised coal material 2. Internal Audit Management System 3. Mining Operation Plan 4. Supervisor Inspections 5. Supervisor Audits	5	e	5e	25 (L)					
		Waste Management (during service days)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Employee Inductions	5	d	5d	24 (L)					
		Major shut downs (contractor)	5	b	5b	19 (L)	1. Environmental Protection Licence 2. Onsite Waste bins 3. Use of Licensed Contractor for waste removal 4. Contractor Management System 5. Contractor Inductions 6. Supervisor Inspections 7. Employee Inductions	5	d	5d	24 (L)					
	Mining of coal	Noise	3	d	3d	17 (L)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Competency Management System 7. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	e	3e	20 (L)					
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections	4	d	4d	21 (L)					
		Groundwater	3	c	3c	13 (M)	1. Experience mining in the area.	4	d	4d	21 (L)	*1. Groundwater Assessment* *2. Groundwater Model* *Note: Groundwater quality not suitable for use (ie. saline, deep)*	4	d	4d	21 (L)

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Hydrocarbon contamination of pit-water (pumps, spills)	3	c	3c	13 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox talks 6. Dedicated Experienced employee 7. Incident Notification and Reporting Procedure 8. Supervisor Inspections 9 Supervisor Audits	4	d	4d	21 (L)					
	Hauling with rear dump trucks	Noise	3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Competency Management System 7. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	d	3d	17 (L)					
		Dust	3	c	3c	13 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Visual	3	c	3c	13 (M)	1. Progressive Rehabilitation 2. Mine Planning 3. Timber screening 4. Informal Operational procedures (night lighting) 5. Community Consultation 6. Complaints Protocol	3	d	3d	17 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections	4	e	4e	23 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
	Hauling with on-highway trucks	Noise	3	c	3c	13 (M)	1. Contractor Management System 2. Engineer's Audits 3. RTA registered trucks 4. Six monthly shaker tests 5. Maintenance Management Systems 6. Complaints Protocol 7. Supervisor Inspections 8. Contractor Inductions 9. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	e	3e	20 (L)					
		Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Contractor Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Contractor Inductions 5. Contractor Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Contractor Inductions 5. Contractor Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	4	d	4d	21 (L)					
		Exhaust emissions	4	b	4b	14 (M)	1. Original Equipment Manufacturer Standards 2. Maintenance Management System 3. Defect Management System 4. Supervisor Inspections 5. Contractor Management System 6. Contractor Inductions 7. RTA Approval (Rego check) 8. Engineers Audits	4	e	4e	23 (L)					
	Overburden dump (in pit)	Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits	4	d	4d	21 (L)					
		Noise	3	c	3c	13 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Altered Operating Conditions at set times (ie night time) to reduce noise.	3	d	3d	17 (L)					
	In pit water management	Broken leaking pipes (on surface)	4	b	4b	14 (M)	1. Maintenance Management System 2. Scheduled Environmental Inspections 3. Inspection Management System 4. Supervisor Inspections 5. Engineering principles applied to design 6. Incidents Reporting Procedure 7. Dedicated Experienced person 8. Supervisor Audits	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAIN DIG

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Discharge from open drains (dirty water system)	2	c	2c	8 (M)	1. Scheduled Environmental Inspections 2. Inspection Management System 3. Supervisor Inspections 4. Engineering principles applied to design 5. Incidents Reporting Procedure 6. Dedicated Experienced person	2	e	2e	16 (L)					
		Cross contamination of water segregation under extreme rainfall conditions	2	c	2c	8 (M)	1. Managing the level of Lake Foster 2. Discharge Water Management System 3. EPA Licence 4. Site Inspections 5. Scheduled Environmental Inspections 6. Nominated Experienced person	3	d	3d	17 (L)					
		Failure of clean water segregation	2	d	2d	12 (M)	1. Scheduled Environmental Inspections 2. Inspection Management System 3. Supervisor Inspections 4. Engineering principles applied to design 5. Incidents Reporting Procedure 6. Nominated Experienced person	3	d	3d	17 (L)					
	Bulk fuel storage	Bulk fuel storage (Portable Fuel Storage 1 x 40,000L, 1 x 15,000L, 2 x 5,000L) - Damage to side wall resulting in leak (NB: 40000L used for refuelling, others for supply and pumps)	2	c	2c	8 (M)	1. Towed empty only 2. Towed over prepared surfaces and under supervision only 3. Ensure tanks are always within the site 4. Supervisor Audits 5. Located in a temporary earth containment area 6. Scheduled Environmental Inspections 7. Maintenance Management System 8. Isolated storage area	3	d	3d	17 (L)					
		Spillage from the fuel fill point during filling of equipment	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	4	d	4d	21 (L)					
		Spillage from tank as a result of hose being pulled off by equipment	2	c	2c	8 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits 9. Emergency Cut off valve	4	d	4d	21 (L)					
	Sewerage treatment plant	Contamination of water ways (1 x main office, 1 x open cut workshop)	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. Scheduled Environmental Inspections	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - REHABILITATION

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
Rehabilitation	Reshaping (Overburden dumps)	Dust	3	b	3b	9 (M)	1. Mindful of weather (wind) conditions 2. Employee Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Competency Management System 8. Toolbox Talks	4	d	4d	21 (L)					
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management System 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits 6. Toolbox Talks	3	d	3d	17 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8 Supervisor Audits	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Competency Management System 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits 9. Toolbox Talks	4	d	4d	21 (L)					
		Erosion and sediment control	4	c	4c	18 (L)	1.Draft Erosion and Sediment Control Plan 2. Scheduled Environmental Inspections 3. External Audits (including Government) 4. Environmental Protection Licence 5. Existing Sediment Control Dams	5	d	5d	24 (L)					
	Top dressing material spreading and contour ripping	Dust	3	b	3b	9 (M)	1. Mine Transport Management Plan 2. Inductions 3. Land Disturbance Management System (dust) 4. Water cart availability 5. Complaints Protocol 6. Supervisor Inspections 7. Supervisor Audits 8. Mindful of weather (wind) conditions	4	d	4d	21 (L)					
		Noise	3	b	3b	9 (M)	1. Employee Inductions 2. Maintenance Management Systems 3. Complaints Protocol 4. Supervisor Inspections	3	d	3d	17 (L)					
		Spillage of hydraulic oil from damaged hose	4	c	4c	18 (L)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)					
		Spillage of Hydrocarbons when transferring from Service Truck	4	b	4b	14 (M)	1. Maintenance Management System 2. Emergency Spill Response 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox talks 6. Incident Notification and Reporting Procedure 7. Supervisor Inspections 8. Supervisor Audits	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - REHABILITATION

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
		Erosion and sediment control	4	c	4c	18 (L)	1. Draft Erosion and Sediment Control Plan 2. Scheduled Environmental Inspections 3. External Audits (including Government) 4. Environmental Protection Licence 5. Supervisor Inspections 6. Existing Sediment Control Dams	5	d	5d	24 (L)					
		Lime and gypsum dust	4	c	4c	18 (L)	1. Control moisture levels of lime	5	d	5d	24 (L)					
		Biosolids / runoff (incl odour)	3	c	3c	13 (M)	1. Use of DECC guidelines 2. Bunded storage areas	3	d	3d	17 (L)					
	Revegetation	Erosion with sediment leaving site	4	c	4c	18 (L)	1. internal drainage for part of the area 2. Draft Erosion & Sediment Control Plan 3. Existing Sediment Control Dams	5	d	5d	24 (L)					
		Potential to introduce weeds	4	c	4c	18 (L)	1. Buy certified seed from reputable supplier 2. Vehicle wash at entrance 3. Employee inductions 4. Scheduled Environmental Inspections 5. Weed Control Contractors	4	d	4d	21 (L)					
		Failure of seed to germinate and establishment	4	c	4c	18 (L)	1. Buy certified seed from reputable supplier 2. Employee and Contractor Inductions	5	d	5d	24 (L)					
		Bush fire hazard burning revegetated areas	3	c	3c	13 (M)	1. Employee Induction 2. Hazard reduction program 3. Competent employees 4. Bushfire Management Plan 5. Onsite fire fighting capabilities 6. Contractor Induction	4	d	4d	21 (L)					
		Sponcom in rehabilitated areas (odour)	4	d	4d	21 (L)	1. Burial of oxidised coal material 2. Supervisor Inspections 3. Mining Operation Plan 4. Mining Operations Inspection Management System	5	e	5e	25 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAINTENANCE

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
Maintenance / Open Cut Workshop	Waste Management	General Refuse (incl oily rags)	4	b	4b	14 (M)	1. Licensed Waste Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Toolbox Talks 6. Scheduled Environmental Inspections	5	d	5d	24 (L)					
		Scrap steel	5	b	5b	19 (L)	1. Licensed Recycling Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Toolbox Talks 6. Scheduled Environmental Inspections	5	e	5e	25 (L)					
		Contaminated Wastes	4	b	4b	14 (M)	1. Licensed Recycling Contractor 2. Contractor Management System 3. Employee Inductions 4. Environmental Protection Licence 5. Incident Reporting Procedure 6. Toolbox Talks 7. Scheduled Environmental Inspections	5	d	5d	24 (L)					
		Oil spills on ground	4	b	4b	14 (M)	1. On-site Spill Kits 2. Employee Inductions 3. Employee Consultation Systems 4. Emergency Response Procedure 5. Incident Reporting Procedure 6. Toolbox Talks 7. Scheduled Environmental Inspections	5	d	5d	24 (L)					
		Tyres	4	b	4b	14 (M)	1. Disposed of in the pit at depth	5	d	5d	24 (L)					
	Bulk fuel storage area (fuel farm)	Spills and leaks	3	b	3b	9 (M)	1. AS1940 approved area 2. Work Cover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Emergency Response Procedure 7. Incident Reporting Procedure	4	d	4d	21 (L)					
		Damage to above ground pipes (fuel and oil)	3	b	3b	9 (M)	1. AS1940 approved area 2. Work Cover notified 3. Incident Reporting Procedure 4. Emergency Response Procedure 5. Scheduled Environmental Inspections 6. Toolbox Talks	4	d	4d	21 (L)					
		Bunded area filling with storm water reducing containment and resulting in bund breach during major spill	4	b	4b	14 (M)	1. AS1940 approved area 2. Work Cover notified 3. Maintenance Management System 4. Bilge Pump system in place in bunded areas 5. Incident Reporting Procedure 6. Emergency Response Procedure 7. Scheduled Environmental Inspections 8. Toolbox Talks	5	d	5d	24 (L)					
	Refuelling bay (conducted in Workshop - 3 x 30,000L tanks)	Spills and leaks	3	b	3b	9 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Emergency Response Procedure 7. Incident Reporting Procedure 8. Scheduled Environmental Inspections	4	d	4d	21 (L)					
		Damage to above ground pipes (fuel and oil)	3	b	3b	9 (M)	1. AS1940 approved area 2. Work Cover notified 3. Incident Reporting Procedure 4. Scheduled Environmental Inspections	4	d	4d	21 (L)					
		Hose coming away from bowser (vehicle drives away with hose still attached)	2	b	2b	5 (H)	1. AS1940 approved area 2. Work Cover notified 3. Employee Inductions 4. Automatic shut-offs 5. Incident Reporting Procedure 6. Toolbox Talks	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAINTENANCE

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P	R			C	P	R		C	P	R	
	Oil storage area	Spills and leaks	4	b	4b	14 (M)	1. AS1940 approved area 2. Work Cover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Emergency Response Procedure 7. Incident Reporting Procedure 8. Scheduled Environmental Inspections	5	d	5d	24 (L)					
	Transformers	Release of PCB's in transformer oil	2	b	2b	5 (H)	1. PCB Disposal Procedure 2. Transformers in bunded areas 3. Following check on site found that no known PCB's on site.	5	e	5e	25 (L)				
		Oil spills	4	b	4b	14 (M)	1. Recycled 2. On-site Spill Kits 3. Employee Inductions 4. Transformers in bunded areas 5. Incident Reporting Procedure 6. Scheduled Environmental Inspections	5	d	5d	24 (L)				
	Parts washer	Failure and release degreasers/contaminants to the environment	4	b	4b	14 (M)	1. Serviced by licensed contractor 2. Contractor Management System 3. On-site Spill Kits 4. Employee Inductions 5. Incident Reporting Procedure	5	d	5d	24 (L)				
	Oil water separator	Failure and release of oil	4	b	4b	14 (M)	1. Waste oil tank with overflow monitor 2. Scheduled Environmental Inspections 3. Serviced by licensed contractor 4. Contractor Management System 5. On-site Spill Kits 6. Employee Inductions 7. Incident Reporting Procedure	5	d	5d	24 (L)				
	Workshop	Noise	3	d	3d	17 (L)	1. Isolated location 2. Employee Induction 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits	3	e	3e	20 (L)				

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - MAINTENANCE

Process Area	Activity	Aspect	Raw				Existing Controls	Existing Controls			Proposed Controls	Residual Risk			
			C	P	R			C	P	R		C	P	R	
	Field Maintenance 1. Scheduled shut downs 2. breakdowns/running repairs	Noise	3	d	3d	17 (L)	1. Where ever possible maintenance conducted off site 2. Employee Induction 3. Complaints Protocol 4. Supervisor Inspections 5. Supervisor Audits	3	e	3e	20 (L)					
		Contaminated Waste Material	4	b	4b	14 (M)	1. Licensed Waste Contractor 2. Contractor Management System 3. Employee Inductions 4. EPL 5. Toolbox Talks 6. Maintenance Management System 7. Supervisor Inspections 8. Supervisor Audits	5	d	5d	24 (L)					
		Spills and leaks	4	b	4b	14 (M)	1. AS1940 approved area 2. WorkCover notified 3. On-site Spill Kits 4. Employee Inductions 5. Toolbox Talks 6. Emergency Response Procedure 7. Incident Notification and Reporting Procedure 8. Maintenance Management System 9. Supervisor Inspections 10. Supervisor Audits	5	d	5d	24 (L)					
		Transfer of diesel and lubes around site in service truck (accident - rollover)	3	c	3c	13 (M)	1. Mine Transport Management Plan 2. Employee Inductions 3. Purpose designed service truck 4. Compartmentalised tank 5. Competency Standard for service truck 6. Emergency Response Procedure 7. Bushfire Management Plan 8. Incident Notification and Reporting Procedure	4	d	4d	21 (L)					

BLOOMFIELD COLLIERY ENVIRONMENTAL RISK REGISTER - SUPPLY

Process Area	Activity	Aspect	Raw (potential risk)				Existing Controls	Existing Controls				Proposed Controls	Residual Risk			
			C	P	R			C	P	R			C	P	R	
Supply	Bulk Fuel Storage	***(See Maintenance)***														
	Transfer of fuel from road transport	Spillage of fuel during delivery of bulk fuel and oil	2	c	2c	8 (M)	1. Fuel & Bulk Oil Delivery Procedures 2. Contractor Management System 3. Contained delivery point 4. Use of competent delivery contractor 5. System audits 6. Incident Notification and Reporting Procedure 7. Scheduled Environmental Inspections 8. Emergency Response Procedure	3	d	3d	17 (L)					
		Damage to transport vehicle on site at refuelling point (eg. Light vehicle running into fuel truck)	3	c	3c	13 (M)	1. Engineering separation from earthworking equipment 2. Delivery trucks have segregated tanks 3. Emergency Response Procedure 4. Tanks located away from traffic areas	4	e	4e	23 (L)					
		Release of fuel to the environment as a result of a vehicle involved in accident on site	2	c	2c	8 (M)	1. Mine Transport Management Plan 2. Fuel & Bulk Oil Delivery Procedures 3. Contractor Management System 4. Safety Core Risk Assessment 5. Toolbox Talks 6. Competency Management System 7.Emergency Response Procedure	4	d	4d	21 (L)					
		Fuel transfer truck driving away from fill point with out disconnecting fuel supply hose	3	c	3c	13 (M)	1. Contractor has cut-off system whereby they cannot start the vehicle if a hose is still connected 2. Use of competent contractor 3. Contractor Management System 4. Bunded Area (AS1940) 5. Emergency Response Procedure 6. Fuel & Bulk Oil Delivery Procedures	5	e	5e	25 (L)					

APPENDIX 3

DMR REHABILITATION CLEARANCE

30th August 2004.

The General Manager
Bloomfield Colliery Pty Ltd
P.O. Box 4
EAST MAITLAND
NSW 2323

MINERAL RESOURCES NEW SOUTH WALES

NSW DEPARTMENT OF MINERAL RESOURCES
Level 1, 1 Civic Avenue
(P.O. Box 51), Singleton, NSW 2330, Australia
INSPECTORATE: Phone (02) 6572 1899 · Fax (02) 6572 1201
GEOLOGY: Phone (02) 6572 4200 · Fax (02) 6572 1201
MINING TITLES: Phone (02) 6572 4200 · Fax (02) 6572 1201
www.minerals.nsw.gov.au
DX 7071

File No: L89/0085

ABN 51 734 124 190-003
A BRANCH OF THE NEW SOUTH WALES
DEPARTMENT OF PRIMARY INDUSTRIES

Dear Sir,

FINAL REHABILITATION CLEARANCE BLOOMFIELD OPEN CUT COAL MINE K CUT SOUTH OF STONY PINCH RESERVOIR

On the 6th August 2003 Scott Brooks Environmental Officer, from the Department of Mineral Resources together with John Hindmarsh conducted a rehabilitation inspection at the Bloomfield O/C Mine on an area known as K Cut South of Stony Pinch Reservoir. The purpose of this inspection was to determine if the condition of the rehabilitation had achieved standards to satisfy the rehabilitation criteria outlined in the Departments Rehabilitation and Mine Closure Policy EDP 05.

An assessment of the inspection indicates the standard of the works reviewed to be satisfactory. All-9 points of assessment in the policy were considered and found to be acceptable to contemporary Departmental standards.

We suggest this be recognised by the areas permanently being indicated on all plans in correspondence with the Department. All plans should show this area to be rehabilitated to an accepted standard. This would include the next AEMR report and the MOP to be produced shortly. It is possible to change the Mining Lease or Colliery Holding Boundary to reflect this acceptance. However both involve considerable administrative effort, and given Bloomfield's unique Mining Lease arraignment, would mean very little. We understand the area will remain under Bloomfield's management so retaining some of the provisions of the Mining Lease will be beneficial.

Please find enclosed, for your records, the DMR Rehabilitation Assessment to support this letter of rehabilitation acceptance.

For clarification or further information on any matter, please contact Scott Brooks at the Department on (02) 6572 1899.

Yours faithfully

GREG SUMMERHAYES
Principal Environmental Officer
Environmental Sustainability Division.

DMR Rehabilitation Assessment

Bloomfield Area K cut south of the Stony Pinch reservoir was assessed against the Departments Policy on Rehabilitation and Mine Closure. This assessment was carried out on the 6th August 2003. All 9 points of assessment in the policy were considered and found to be acceptable to contemporary Departmental standards. Attached to this assessment is Bloomfield's own supporting documentation.

The current relinquishment requirements are as follows:

Be based on mine closure criteria and rehabilitation outcomes developed through stakeholder consultation;
The operation at Bloomfield is not covered by any development consent requirements under the EP&A Act. There is no Closure Plan for the site although one is expected shortly.
A landowner acceptance letter from Ashtonfield's Pty Ltd is attached.
The landuse of the reviewed area is compatible with the Cessnock LEP.

Be suitable for an agreed subsequent land use as far as possible compatible with the surrounding land fabric and land use requirements;
This land is required to be rehabilitated and returned to natural bush. The landform all has slopes less than 10 degrees and is free draining. This is consistent with the surrounding land. Coverage by surface rocks is minimal and the vegetation species chosen can be expected to mature to a similar species mix to the surrounding land in forested areas. The open grass areas has a grass cover equivalent to nearby grazing land to the west, and will continue to do so, if grazed. If the area is not grazed, trees can be expected to invade and become dominant on the site. This is a similar response to ungrazed land in the Maitland area.

Be sustainable in terms of that land use;
The eastern end of the area has been rehabilitated for a long time (15 years) with no signs of significant erosion present. Biosolids have been used as a soil ameliorant over much of the area. This product can be expected to assist the pasture growth for some time without the need for supplementary fertilisers.

Address heritage issues;
There are no significant heritage issues on this site

Have stable and permanent landforms, these may include voids, pits and water-bodies providing that they are part of the accepted final outcome;
The site appeared stable with the following relevant comments:

There was one small dam on the site that held water, had a stable dam wall and spillway and would provide water to stock or wildlife.
All long slopes were treated with contour banks and were stable.
There were no major drainage lines on the site.

A small area of land was found to be bare and this has been remediated.
There was a moderately severe infestation of Pampas Grass on the site. These have been sprayed and any regrowth is to be managed to the satisfaction of the Rural Lands Protection Board.

Have landforms, soils, hydrology, and ecosystems with maintenance needs no greater than those of surrounding land;
To date the area has been managed with the use of slashers and the periodic use of biosolids. This has produced a balanced mix of grass and tree species. This will produce adequate species diversity to provide for persistent vegetative cover for the long term on this site. Older (15years) rehabilitation in the area assessed demonstrates that an adequate cover will persist on this style of rehabilitation. It is expected that Bloomfield will continue to maintain the site. There are no soils or hydrology issues that will need any additional maintenance.

Securely and safely contain waste substances that have the potential to affect land use or result in pollution;
There are no known waste substances on the subject land

Not present a hazard to persons, stock or native fauna;
There is only one shallow dam on the site that will not present a hazard to stock. There are a small number of benign small gullies on the site. These would not be a safety hazard.

Have minimal environmental effect outside the disturbed area;
Most the area drains to the east through the small dam mentioned above. There is no evidence of recent sediment deposition in this dam. The pH and EC. of this dam are 7.8 and 200um/cm respectively and are within the range of values expected in the Maitland district. The site is not visual from outside the mine site. There are no known contaminants on this site. This area has minimal runoff and would produce little dust. It is of similar capability (Class VI) to its surrounding land.

Supporting Information and References

Enclosed in Appendix A is plan outlining the area inspected for final clearance,
Enclosed in Appendix B Landholder acceptance from Ashtonfields Pty Ltd.
Enclosed in Appendix C are the Transect results,
Enclosed in Appendix D is a suite of photos together with relevant comments.

The current land manager is Bloomfield Collieries. They plan to maintain management of the site for the foreseeable future.

Security Deposit Status

There is no direct security deposit held for Bloomfield Collieries. There is a link to the security held for Rix's Creek mine and this is to remain unchanged.

Conclusion
The areas indicated on the plan in Appendix A are accepted as achieving a satisfactory standard of rehabilitation. As with any land this land will continue to require regular maintenance and be grazed using responsible stocking rates if applicable.

Scott Brooks