Centennial Coal

CENTENNIAL COAL
MYUNA COLLIERY
ANNUAL REVIEW

March 2015

Centennial Coal
Environment Matters

Table 1 Annual Review Title Block

Name of Operation	Myuna Colliery
Name of Operator	Centennial Myuna Pty Ltd.
Development Consent/ Project Approval #	PA10_0080 MOD1 SH110/148
Mining Lease #	ML1632 ML1370 MPL334
Name of Holder of Mining Lease	Centennial Myuna Pty Ltd.
Water License #	20BL172565 20BL173259
Name of Holder of Water License	Centennial Fassifern Pty Ltd.
MOP/RMP Start Date	July 2013
MOP/RMP End Date	31st December 2015
Annual Review Start Date	1st January 2015
Annual Review End Date	31st December 2015

I, Mick Cairney , certify that this audit report is a true and accurate record of the compliance status of Myuna Colliery for the period 1st January 2015 – 31st December 2015 and that I am authorised to make this statement on behalf of Centennial Myuna Pty Ltd.

Note:

a) *The Annual Review is an 'environmental audit' for the purposes of s122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion) in an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents –maximum penalty 2 years imprisonment or $22,000,or both).*

Name of Authorised Reporting Officer	Mick Cairney
Title of Authorised Reporting Officer	Executive General Manager Operations
Signature of Authorised Reporting Officer	
Date	24-3-16

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Tables

1. STATEMENT OF COMPLIANCE

Table 2 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
Project Approval 10_0080 MOD1	NO
Development consent SH110/148	YES
Mining Lease 1632	YES
Mining Lease 1370	YES
Mining Purposes Lease 334	YES
Exploration Lease 4444	YES
Exploration Lease 6640	YES
Bore Licence 20BL172565	YES
Bore Licence 20BL173259	YES
Environment Protection Licence 366	NO
Section 151 Point Wolstoncroft SCA	YES
Section 151 Pulbah Island SCA	YES
Section 151 Wangi Point SCA	YES

Table 3 Non Compliances

Relevant Approval	Condition #	Condition summary	Compliance Status	Comment	Section addressed in Annual Review
PA10_0800	Sch 5 c11	Access to information		Complaints register	Section 11 Table 22
EPL366	M8	Requirement to monitor volume		Failure to monitor continuously	Section 11 Table 23
EPL366	L2	Water concentration limit		Exceedance of concentration limit	Section 11 Table 24
EPL366	L2	Water concentration limit		Exceedance of concentration limit	Section 11 Table 25
EPL366	L2	Water concentration limit		Exceedance of concentration	Section 11 Table 26

				limit	
EPL366	L3	Volume limit		Exceedance of volume limit	Section 11 Table 27
EPL366	M4	Requirement to monitor noise		Non compliance with monitoring schedule	Section 11 Table 28

Note: Compliance Status Key for Table 3

Risk Level	Colour Code	Description
High		Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium		Non-compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low		Non-compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or Potential for low environmental consequences, but is likely to occur
Administrative		Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2. INTRODUCTION

Myuna Colliery is an underground coal mine owned and operated by Centennial Myuna Pty Limited. Myuna is located 25 km south west of Newcastle NSW in the Lake Macquarie and Wyong Local Government Areas.

Lake Macquarie City Council (LMCC) granted Development Consent SH110_148 (Appendix 1) for the development and operation of the Myuna and Cooranbong Collieries in 1977. The Development Consent was granted pursuant to the provisions of the now repealed Local Government Act 1919. The Development Consent remains in force and authorises the extraction of coal within the Development Consent Mining Area.

The Development of Myuna Colliery began in 1979 and underground mining using bord and pillar mining methods commenced in 1982. Centennial Coal Company Ltd acquired Myuna Colliery in 2002, and has operated the mine since this time.

On 18 January 2012, the then Minister of Planning and Infrastructure granted Project Approval (PA) 10_0080 to Centennial Myuna. A modification to PA10_0080 was approved 1st February 2015 (Appendix 2).

PA 10_0080 (MOD1) authorises the continued mining in areas outside the existing Development Consent SH110_148 mining area and within the boundary of existing mining leases held by Centennial Myuna. PA 10_0080 MOD1 authorises:

- the use of bord and pillar methods in the Wallarah, Great Northern and Fassifern coal seams;
- the continued use of ancillary infrastructure until 31st December 2032;
- The extraction of not more than 3 million tonnes of ROM coal from the site in any calendar year.

This Annual Review 2015 details the environment and community performance of Myuna Collieries operations for the twelve month period ending 31st December 2015.

The Annual Review has been prepared in accordance with the Department of Planning Annual Review Guideline October 2015.

The following are the mine contacts for any information with regards to this report.

Table 4 Myuna Colliery Contacts

Name	Position	Email Address	Contact Telephone Number
Mal Yule	Mine Manager	myunacolliery@centennialcoal.com.au	
Pieter Van Rooyen	Technical Services Manager		
Morgan Gleeson	Environment and Community Co-ordinator		02 4970 0263

3. APPROVALS

The Colliery lease lies within the Parishes of Awaba, Coorumbung, Morisset and Wallarah in the County of Northumberland subsidence district and is located within the Shire of Lake Macquarie.

The Myuna Colliery Holding is covered by Mining Lease No 1632. Mining Lease No 1632 includes a surface land area of 33 hectares for mine infrastructure (Mining Purposes Lease No. 334). The total lease area is 7426.5 hectares.

Centennial Myuna had subleased part of Consolidated Coal Lease No 762 held by Centennial Mandalong Pty Limited. The sublease area was then transferred to Centennial Myuna Pty Limited as ML1632. Effectively ML1632 replaced Part CCL762. The lease areas are shown on the Myuna Colliery Holding Plan PC14.

Myuna Colliery is classed a Level 1 mine. PA 10_0080 was granted by the Minister for Planning on 18th January 2012 under Section 75J of Part 3A of the EP&A Act 1979.

A summary of Myuna's Approvals, Authorities and Licences is presented in the Tables below.

Table 5 Myuna Colliery Approvals

Approvals			
Approval Number	**Summary**	**Date Granted**	**Expiry Date**
SH. 110/148	Development Consent for Myuna Colliery	21/12/1977	No expiration date specified in the consent. Subject to renewal of mining leases
PA 10_0080	Project Approval	18/01/2012	Superseded
PA 10_0080 (MOD1)	Modification to Project Approval (increase ROM production from 2 to 3 Mtpa)	27/02/2015	31/12/2032

Table 6 Myuna Colliery Mining Authorisations

Mining Authorisations			
Approval Number	**Summary**	**Date Granted**	**Expiry Date**
ML 1632	Mining Lease	13/04/2013	13/10/2022
MPL 334	Mining Purposes Lease	20/10/1994	20/10/2036
ML 1370	Mining Lease	26/09/1995	02/12/2016
EL 4444	Exploration Lease	23/10/1992	23/10/2017
EL 6640	Exploration Lease	23/10/1992	23/10/2017

Table 7 Myuna Colliery Licences and Permits

Licences and Permits			
Approval Number	**Summary**	**Date Granted**	**Expiry Date**
Section 151 Licence	Mining Operations – Various Licence, Point Wolstoncroft	11/09/2015	10/09/2020
Section 151 Licence	Mining Operations – Various Licence, Pulbah Island	1/11/2011	31/10/2016
Section 151 Licence	Mining Operations – Various Licence, Wangi Wangi Point	16/02/2016	15/02/2021
20BL172565	Bore Licence (Dewatering ground water 4380 ML)	13/12/2010	12/12/2015
20BL173259	Bore Licence (Monitoring Bores)	7/08/2012	Perpetuity
D 171027	Trade Waste Permit	23/10/1995	N/A
EPL 366	Environment Protection Licence (EPL)	10/07/2000	N/A

3.1 Project Approval 10_0800 MOD1

Centennial Myuna sought to modify Project Approval 10_0800 pursuant to Section 75W of Part 3A of the EP&A Act to allow for :

- An increase in ROM coal extraction to up to 3 million tonnes per annum; and
- An increase in employment to up to 300 full time employees.

The modification to the PA10_0800 was approved by the DPE 1st February 2015.

3.2 Mining Purposes Lease 334

The MPL 334 was renewed by The Department of Industry, Resources and Energy on 20th October 2015 and expires 20th October 2036. The lease conditions were amended upon renewal and were set out in schedule 2 of the lease document.

The conditions set out are pursuant to the Mining Act 1992 and are required to :

- Ensure optimal resource recovery;
- Prevent minimize and/or offset adverse environmental impacts;
- Provide for the ongoing environmental management of the project; and
- Ensure areas disturbed by mineral production and exploration activities are appropriately rehabilitated.

3.3 Mining Lease 1632 and 1370

In accordance with the provisions of Section 168 (1) of the Mining Act 1992, the Minister approved the suspension of Condition 25 of ML1632 and Condition 32 of ML1370, relating to the High Water Level Control Zone. The suspension took effect from the 25th June 2015 and will remain in force for the remaining term of the titles.

3.4 Section 151 Licence Point Wolstoncroft

The Section 151 Licence approves access to Point Wolstoncroft, Lake Macquarie State Conservation Area for the purpose of subsidence monitoring. The licence was renewed by National Parks and Wildlife Service 11th September 2015 and expires 10th September 2020.

3.5 Bore Licence 20BL172565

The Bore Licence 20BL172565 was renewed by the NSW Office of Water 12th December 2015. Centennial Myuna had not received the conditions of the licence at the time of producing this report.

3.6 Environment Protection Licence 366

EPL366 was varied by notice 1527732 issued on 13th May 2015 and notice 1533862 issued on 13th November 2015.

The following variations were made to EPL366 by notice 1527732;

- EPA amended waste table limit to make reference to new Waste Regulation;
- EPA amended the location of the sensitive receivers to be consistent with the planning consent and assessments;
- EPA amended noise monitoring requirements; and
- EPA removed the reference to 2014 reporting as this is covered in monitoring.

The following variations were made to EPL366 by notice 1533862;

- Increased the fee based activity for Coal Works and Mining for Coal;
- Increased the ROM coal limit to 3 MTPA and amended the planning approval date;
- EPA amended the plan details due to provision of an updated plan of the premises;
- EPA updated plan of the premises details and eastings and northings of HVAS;
- Removed condition M5.4;
- EPA added a coal transport condition consistent with the development consent;
- EPA removed PRP1 – Assessment of potential impacts of metals as complete.

4. OPERATIONS SUMMARY

Table 8 Production Summary

Material	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock/ Overburden	N/A	Nil	Nil	Nil
ROM Coal	3,000,000	1,874,318	1,707,027	1,823,463
Coarse reject	Nil	Nil	Nil	Nil
Fine reject (Tailings)	Nil	Nil	Nil	Nil
Saleable product	3,000,000	1,874,424	1,707,358	1,823,463

4.1. Other Operations

Table 9 Operations Summary

	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Comment (if applicable)
Hours of operation	8760	8760	8760	
Transport (rail)	Nil	Nil	Nil	
Transport (road)	Nil	Nil	Nil	
Overland Conveyor	8760	8760	8760	

4.2. Next Reporting Period

There is no significant material change planned for Myuna Colliery in the next reporting period.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The 2014 Annual Review was submitted to the Department of Industry - Division of Resources and Energy (DRE) 31st March 2015 and the Department of Planning and Environment (DPE) 26th March 2015 in accordance with Schedule 5, condition 4 of the Project Approval 10_0080.

DRE reviewed the Annual Review and determined that the report generally satisfied the requirements of relevant conditions of the company's mining leases. DRE accompanied by DPE conducted a detailed site inspection of Myuna pit top and infrastructure areas on 19th August 2015. The purpose of the inspection was to review compliance with environmental requirements of relevant approval instruments including the Mining Lease, Mining Operation Plan (MOP) and Annual Environmental Management Report (AEMR).

During the inspection, there was general compliance with the relevant statutory approval instruments administered by the DRE. The Department acknowledged the company's efforts to improve general house keeping, in particular hydrocarbon storage.

DRE required no actions to be taken from the previous Annual Review.

DPE correspondence received 10th September 2015 outlines the actions required following the report review and site inspection.

Table 10 Actions from Previous Annual Review

Action Required	Requested By	Action Taken	Where addressed in Annual Review
Provide an Executive Summary of significant activities, complaints incidents, breaches and non-compliances which occurred during the reporting period with future Annual Reviews.	DPE	Statement of compliance	Section 1
Provide further detail in regard to weed management onsite, including a location plan detailing areas of spraying and which weed species were targeted in future Annual Reviews.	DPE	Weed Action Plan	Section 6.3 Appendix 3
Develop a site water balance which must be included in future Annual Reviews. It is recommended that as a minimum the Input- Output model of the Water Accounting Framework developed by the Minerals Council of Australia be used in development of this site water balance.	DPE	Water Balance developed and included in Annual Review	Section 7.4
the Myuna Colliery website did not contain a community complaints register nor evidence of monthly update as required	DPE	Community Complaints register uploaded to website	Section 11
The wash down sediment sump above the CHP dam contained visible hydrocarbon.	DPE	Sampling and analysis of water in	Section 12

As this water is transferred to the underground workings it is recommended that a need for a system to remove hydrocarbons from this water be investigated.		sump conducted	
A moderate amount of sediment was noted on the road from the CHP to the coal desilt storage area. It is recommended that efforts should be made to prevent the amount of sediment build up and potential overflow into the below gully.	DPE	Sediment removed. Scheduled maintenance.	Section 6.2

6. ENVIRONMENTAL PERFORMANCE

6.1 Noise

The control strategies were implemented as per the Noise Management Plan and were adequate to manage the risks associated with the operation during the report period.

The Myuna Colliery Noise Management Plan outlines potential sources and impacts of raised noise levels. The Plan also identifies measures which must be in place to reduce noise levels. All contractors and employees undergo induction and regular refresher training to help identify responsibilities.

Result Summary

The noise monitoring data is assessed against the Project Approval and EPL limit criteria. There were no exceedances of the noise limit criteria for the report period.

Attended noise monitoring was undertaken quarterly for the report period during the day, evening and night time periods at all receiver locations.

LAeq noise levels higher than the project EPL noise limits were measured during the daytime, evening and night-time periods, however it was noted that extraneous noise sources, namely road traffic, contributed significantly to these noise levels.

Colliery noise was inaudible at all locations during the day, varied from audible to inaudible in the evening and was generally barely audible / audible at night. LAeq levels were largely controlled by extraneous noise sources such as passing traffic, whereas LA90 levels were controlled by insects or traffic during the day or Colliery operations during the evening and night. Colliery operations were subjectively observed to contribute little to the measured LAeq noise levels during any period throughout the day. Definitive compliance with EPL noise limits was therefore difficult to determine through direct measurement due to the influence of extraneous noise events.

Continuous noise monitoring data from a permanent noise logger installed on site was incorporated into a noise model created using SoundPLAN software in order to determine noise impacts at the eight assessment locations. By modelling on-site noise levels, noise levels at receiver locations were calculated corresponding to on-site noise levels. Measured on-site noise levels indicated noise levels at all receivers were compliant with EPL conditions during the evening and night-time monitoring periods. No non-compliances with the limit criteria were recorded during the evening or night-time period. Due to the inaudibility of the Colliery at all locations during the day, daytime noise emissions are not considered an issue.

A non compliance was recorded with EPL366 condition M4 Requirement to Monitor Noise, (f) Each quarterly monitoring period must be undertaken on a different day of the

week not including Saturdays, Sundays and Public Holidays. The detail of the non compliance is tabled in section 11 of this report.

Trend

Myuna Colliery has undertaken a program of attended noise monitoring from December 2012 to December 2015. The attended monitoring results have shown a consistency over the 3 year period. Colliery operations were subjectively observed to contribute little to the measured LAeq noise levels during any period throughout the day. Extraneous noise sources, namely road traffic, contribute significantly to the noise levels.

EA Prediction

The Myuna Colliery Extension of Mining Project Noise Impact Assessment (Heggies 2010) predicted the operational noise levels and the noise emission levels of the Emergency Stockpile Area during operation would meet the project specific noise criteria at all assessed residential receivers under calm and prevailing weather conditions with the recommended noise mitigation and management strategies in place.

New Material

The number of receiver locations required to be monitored increased from the 2014 reporting period to the 2015 reporting period to satisfy the conditions of EPL366.

A Regional Noise Management Plan which will encompass the Centennial Coal operations, Mandalong, Myuna, Newstan and Northern Coal Services, will be developed and implemented in the next report period.

6.2 Air quality

Control strategies were implemented as per the Air Quality Management Plan and were adequate to manage the risks associated with the operation during the report period.

The Air Quality Management Plan for the site outlines potential sources and impacts of raised dust levels. The Plan also identifies measures which must be in place to reduce dust and environmental activities conducted to minimise elevated dust levels. All contractors and employees undergo induction and regular refresher training to help identify responsibilities.

DPE conducted a detailed site inspection of Myuna Colliery 19th August 2015. The purpose of the inspection was to review compliance with environmental requirements of relevant approval instruments including the Mining Lease, Mining Operation Plan (MOP) and Annual Environmental Management Report (AEMR).

A moderate amount of sediment was noted on the road from the CHP to the coal desilt storage area. DPE recommended that efforts should be made to prevent the amount of sediment build up and potential overflow into the below gully.

Myuna Colliery haul road is serviced by a road sweeper on a scheduled weekly service. The area identified by DPE was not serviced weekly due to an obstruction placed on the edge of the haul road. The haul road has been added to a weekly maintenance schedule for the manual inspection and clean up of fines which are not accessible to the road sweeper.

6.2.1 Depositional Dust Gauge

Result summary

The air quality monitoring data is assessed against the Project Approval and EPL limit criteria. There were no exceedances of the air quality limit criteria for the report period.

Depositional dust monitoring was performed at Myuna Colliery during 2015 on a monthly basis at four depositional dust gauges. The limit criteria for depositional dust is

4g/m^2/month applied as an annual average. The maximum annual average for the months during 2015 at each of the dust gauges is tabled below.

Table 11 Depositional Dust Maximum Annual Average

Dust Gauge	DG1	DG2	DG3	DG4
Grams/m^2 / month	1.0	3.5	3.3	1.7

The Dust Deposition Gauge DG3 from 18th September to 19th October 2015 and from 19th October to 20th November 2015 was heavily contaminated with material not associated with deposited dust. The visual analysis from the field staff indicated that the sample was primarily composed of bird droppings and insects. This was confirmed by comments from Steel River, the NATA accredited laboratory who analysed the sample (see below), and found bird droppings, insects and plant material as the principle components.

"*As such, there is no way or approved method of separating the actual deposited dust from the contamination and the result for this month is not representative of true dust deposition at the site and should not be used in annual averaging.*"

Trend

Myuna Colliery has 12 years of dust monitoring data over a 13 year period from January 2003 to December 2015. Data for a 10 month period from February 2007 to November 2007 is not available.

The 2015 annual average for each dust gauge are consistent with the 13 year long term average. The annual average for DG1 & 2 is slightly above the long term average and for DG3 &4 are slightly below the long term average. The Annual average and long term average for each dust gauge is provided in table 12 below.

Table 12 Dust Gauge Annual and Long Term Average

Dust Gauge	DG1	DG2	DG3	DG4
2015 annual average	0.9	1.2	1.6	1.0
Long Term Average	0.8	1.0	2.1	1.3

The trend analysis was undertaken using a linear trend line for the dust deposition monitoring from January 2003 to December 2015. DG 1 displays a slight decreasing trend for the monthly dust deposition. DG 2 and DG3 show an increasing trend for the monthly dust deposition. DG 4 displays a horizontal trend line.

EA Prediction

The Myuna Colliery Extension of Mining Project Air Quality Impact Assessment (Heggies 2010) predicted the dust deposition levels would be below the Project air quality criteria at all receptors.

6.2.2 HVAS

Result Summary

Air quality monitoring for PM^{10} and Total Suspended Particles (TSP) commenced in August 2013. The monitoring has been conducted in accordance with PA10_0080 condition 17 and EPL366 condition M2.

The air quality monitoring data is assessed against the Project Approval and EPL limit criteria. The limit criteria for the annual average TSP is 90ug/m^3 and PM_{10} is 30ug/m^3. The limit criteria for 24 hour PM_{10} is 50ug/m^3. There were no exceedances of the air quality limit criteria for the report period.

The maximum annual average for the report period for TSP and PM_{10} is tabled below.

Table 13 TSP and PM_{10} Maximum Annual Average

HVAS	TSP	PM_{10}
Micro grams/cubic metre (ug/m^3)	30.33	14.66

The maximum recorded 24 hour PM_{10} concentration for the report period was 34 ug/m^3.

Trend

The 2015 annual average for TSP and PM_{10} is slightly less than the long term average.

The trend analysis was undertaken using a linear trend line for the TSP and PM_{10} monitoring data from August 2013 to December 2015. The trend line indicates a decreasing trend for the TSP and PM_{10} annual average over the long term monitoring period.

Table 14 TSP and PM_{10} Annual and Long Term Average

HVAS	TSP	PM_{10}
2015 Annual Average (ug/m^3)	26.7	13.2
Long Term Average (ug/m^3)	29.6	14.3

EA Prediction

The Myuna Colliery Extension of Mining Project Air Quality Impact Assessment (Heggies 2010) predicted the cumulative annual average TSP and PM_{10} concentrations would be below the project air quality goal at all private receptors. Cumulative maximum 24-hour PM_{10} concentrations attributable to the Project were predicted to be below the project air quality goals at all surrounding dwellings excluding periods of regional pollution events.

New Material

A Regional Air Quality and Greenhouse Gas Management Plan which will encompass the Centennial Coal operations, Mandalong, Myuna, Newstan and Northern Coal Services, will be developed and implemented in the next report period.

6.3 Biodiversity

Control strategies were implemented as per the Biodiversity Management Plan and were adequate to manage the risks associated with the operation during the report period.

The Biodiversity Management Plan for the site outlines measures in place to protect and enhance the Swamp Scleropyll Forest on Coastal Floodplains Endangered Ecological Community on Wangi Creek. All contractors and employees undergo induction and regular refresher training to help identify responsibilities.

Myuna Colliery engaged a consultant to conduct monitoring of the Endangered Ecological Community near Wangi Creek. The Groundwater Dependent Ecosystem Monitoring Report is provided in Appendix 4.

Result Summary

The Myuna Colliery Weed Action Plan 2016 describes (Appendix 3) the weed control work undertaken for the 2015 report period and provides an action plan for the next report period.

Approximately 100 labour hours was employed at the site actively controlling high priority target weeds. This equates to five days with a crew of two carrying out primarily cut and paint bush regeneration methods, supported by foliar spraying for dense Lantana and Crofton Weed infestations.

Weed control work was targeted at Area 4 & 5. The weeds targeted were Bitou Bush, Lantana and Cassia. Weeds targeted in the Wangi Creek Area 4 was Lantana, Bitou Bush and Tree Tobacco. Other weeds targeted in Area 4 were Castor Oil and Pampas Grass. Area 2 was treated for Cape Broom, Cassia and Blackberry.

Trend

From 2012 to the end 2015 there have been four Annual Weed Action Plans conducted at Myuna Colliery, including an annual weed survey and on ground works. This has resulted in the ongoing suppression and removal of Lantana, Bitou Bush, Pampas Grass, Pine Trees and Castor Oil among others.

EA Prediction

The Myuna Colliery Extension of Mining Project Terrestrial Flora and Fauna Assessment (RPS 2011) predicted due to negligible surface impacts the project was unlikely to impact on any threatened species, endangered populations or threatened ecological communities.

New Material

A Regional Biodiversity Management Plan which will encompass the Centennial Coal operations, Mandalong, Myuna, Newstan and Northern Coal Services, will be developed and implemented in the next report period.

6.4 Heritage (Aboriginal and non-Aboriginal)

Control strategies were implemented as per the Aboriginal Cultural Heritage Management Plan and the Non Indigenous Cultural Heritage Management Plan and were adequate to manage the risks associated with the operation during the report period.

Result Summary

Centennial Myuna engaged a Cultural Heritage expert to conduct an Aboriginal due diligence assessment on a section of Morisset Peninsula shoreline. The due diligence assessment was undertaken prior to the installation of subsidence monitoring markers to identify whether:

- Aboriginal objects were present or likely to be present in the Project Area;
- proposed activities are likely to harm Aboriginal objects (if present); and
- to determine whether an Aboriginal Heritage Impact Permit (AHIP) was required.

The visual inspection revealed that the proposed activity was not adjacent to and would not impact on Aboriginal objects and therefore an AHIP was not required.

EA Prediction

The Myuna Colliery Extension of Mining Project Cultural Heritage Assessment (RPS 2011) considered there was minimal potential for impact from the Project on sensitive Aboriginal cultural places or objects or on European cultural heritage items.

New Material

The Cultural Heritage Assessment survey identified sensitive Aboriginal cultural heritage sites, which included sandstone outcrops and rock overhangs. The sites were detailed in Addendum A and Addendum B of the assessment. The recommendation of the Cultural Heritage Assessment was to conduct a program of monitoring if mining was to occur within the immediate vicinity of the sites.

Myuna Colliery will develop a monitoring program for the site recorded in Addendum B of the Cultural Heritage Assessment. The monitoring program will be implemented prior to under mining the site. This may occur during the 2016 reporting period.

Myuna Colliery is proposing a plan to mine under Pulbah Island during the next report period (2016). In accordance with the Northern Holdings Aboriginal Cultural Heritage Management Plan consultation will be undertaken with the registered Aboriginal parties with regard to the management of the site.

The proposed mine plan consists of a bord and pillar mining method which will produce negligible subsidence and no impacts.

Table 6: Environmental Performance

Aspect	Approval criteria/ EIS prediction	Performance during the reporting period (actual)	Trend/ key management implications	Implemented / proposed management action
Noise	Noise limit criteria/ Operations would meet the project specific noise criteria at all assessed residential receivers.	Operations met the project specific noise criteria at all assessed residential receivers.	Maintain management measures.	
Air quality	Air quality limit criteria / below project air quality goal at all private receivers.	Operations below project air quality limit criteria at all private receivers.	DG 3 long term average is significantly higher then dust gauge 1,2 and 4 and shows increasing trend.	Investigate cause of higher dust results.
Biodiversity	Negligible impact / Unlikely to	Negligible impact	Maintain management measures	

	impact			
Heritage	Management Plan / Minimal potential for impact	No impact	Proposed plan to undermine sensitive areas.	Stakeholder consultation. Implement monitoring program.

7. WATER MANAGEMENT

Surface Water Management

Control strategies were implemented as per the Water Management Plan and were in general adequate to manage the risks associated with the operation during the report period. However the control strategies were found to be inadequate in managing the risks associated with a high intensity rainfall event.

Myuna Colliery has a Water Management Plan which discusses responsibilities, pollution sources, hazards, risks and mitigation strategies of water management. Regular refresher training and site inductions discuss water management to make personnel aware of the site issues.

The surface water monitoring has been conducted in accordance with the conditions of EPL366. This Licence specifies monitoring and reporting requirements along with concentration limits for water discharged through LDP A and LDP B. Other EPL monitoring requirements included condition U1 Pollution Studies Reduction Program which encompassed the monitoring of metals from LDP B and condition E1 Manganese monitoring in Wangi Bay.

7.1 LDP B

Result Summary

Mine water discharged from LDP B is required to be monitored daily during discharge for the following parameters;

- Volume;
- pH;
- Total Suspended Solids (TSS); and
- Oil and Grease

Discharge of mine water occurred on 365 days in the report period. A sample was collected and analyzed for the parameters on every day of discharge.

The flow volumes through LDP B are monitored continuously in accordance with EPL366. The daily volume discharge limit for LDP B is 13000kL. The maximum daily volume discharged was 13590kL during the reporting period. The average daily volume discharged for 2015 was 5289kL. There was one exceedance of the LDP B volume limit criteria during the reporting period. Details of the exceedance are tabled in Section 11.

The pH of the mine water discharged through LDP B was consistent throughout 2015 with a maximum pH level of 8.2 and a minimum of 7.0. The limit criteria for pH is a range between 6.5 and 8.5. There were 377 samples analyzed and no exceedances of the concentration limit were identified.

The concentration of total suspended solids analyzed in the mine water discharged through LDP B was consistently low with an average concentration of 8.28 mg/L during 2015. Of the 378 samples analyzed there were three exceedances of the 50mg/L limit

criteria. The exceedances were 60, 63 and 70mg/L. Details of the exceedances are discussed in section 11.

The concentration of oil and grease analyzed in the mine water discharged through LDP B was consistently low with a maximum value of 2 mg/L recorded from 377 samples. The concentration limit for oil and grease is 10mg/L.

Trends

Visual inspection of the flow volume trend, in the Centennial Myuna Annual Groundwater Management Report Figure 4–1(GHD 2015), indicated that extraction from underground workings was decreasing between mid 2013 and 2014. Extraction rates began to increase in 2015.

A linear trend line was applied to the monitoring data from 2011 to 2015 for pH, TSS and oil and grease. The trend line displayed neither an increasing nor decreasing trend over the five year period for all parameters.

Table 15 LDP B Parameters Limit Criteria and Annual Average

Pollutant	Unit of Measure	Licence Limit Criteria	No. of Samples required	No. of Samples Collected	Minimum Value	Mean	Maximum Value
pH	pH	6.5 – 8.5	365	377	7.00	7.66	8.2
Total Suspended Solids	mg/L	50	365	378	0	8.28	70
Oil & Grease	mg/L	10	365	378	0	0.01	2

7.2 LDP A

There was no discharge of water through LDP A during 2015.

7.3 Manganese Monitoring

The monitoring of filterable Manganese is undertaken as per special condition E1 Additional Monitoring of EPL366, in Wangi Bay on a quarterly schedule. There is no limit criteria applied to the Manganese monitoring. The monitoring results are submitted to the EPA.

Result Summary

Four samples are collected quarterly from Wangi Bay at the outlet of Wangi Creek. The average of the samples for each quarter is tabled below.

Table 16 Manganese Quarterly Average

Date	March 2015	June 2015	September 2015	December 2015
Unit - ug/L	57.25	3.5	18	21.75

Trends

The Manganese monitoring has been conducted over a period of five years from 2011. Manganese concentrations recorded in Wangi Bay over the five year period of monitoring display a downward trend. The results have decreased in consecutive years from 2013.

7.4 Metals

GHD Pty Ltd (GHD) was engaged by Centennial Myuna to undertake a water quality assessment of discharged water from Myuna Colliery into Wangi Creek, with a particular focus on the concentrations of metals in water discharged from the mine site as required by Condition U1 of EPL 366. The monitoring of metals from LDP B was undertaken as an EPL Pollution Studies Reduction Program. The Myuna Colliery ANZECC Water Quality Assessment (GHD, May 2015) was submitted to the EPA on the 25th May 2015 in accordance with the condition of EPL366.

Centennial Myuna completed the 24 months of monitoring required from March 2013 to February 2015. The monitoring points identified as Upstream, LDP B, Downstream and Wangi Lake were assessed.

The scope of work for the water quality assessment included the collation and review of historical water quality data, development of site-specific trigger values (SSTVs) in accordance with ANZECC (2000) methodology, and the identification of any additional parameters that may be considered appropriate for future water quality assessments.

7.5 Ground Water

Results Summary

Centennial Myuna was granted Bore Licence 20BL172565 in December 2010 for the purpose of dewatering up to 4,380 ML/ year of ground water from mine workings at Myuna Colliery. Ground water extracted from the underground mine workings is currently discharged from site via LDP B. Volumetric and water quality monitoring data at LDP B is therefore representative of ground water volumes and ground water quality extracted from the mine workings.

The volume of ground water extracted from the works authorized by the licence shall not exceed 4380 ML in any twelve month period commencing the 1st July. The total volume of water discharged through LDP B for the 2014 / 2015 period was 1725.4 ML. There was no exceedance of the Bore Licence criteria.

Table 17 Water Take

License #	Water Sharing Plan, source and management zone (as applicable)	Entitlement	Passive take / inflows	Active pumping	TOTAL
20BL172565	North Coast Fractured and Porous Rock Ground Water Sources	4380	1725.4	1725.4	0

The Wallarah, Great Northern and Fassifern seams contain reservoirs which are used for the retention and filtration of mine water and surface water prior to pumping to the surface settlement ponds. A pump line was established from the CHP dam to the underground reservoir in order to manage the volume of dirty water generated by intense

rain events. The pump line is metered for the purpose of measuring the volume pumped to the underground. The volume of surface water pumped to the underground reservoir during the 2015 report period was 54.5 ML.

The underground water storages in the Wallarah Seam, the Great Northern Seam and the Fassifern Seam are based on an average seam height of 3 m and a recovery ratio of 0.333, Centennial Myuna has estimated the volume of water storages in each of the seams. The underground water storage volumes are shown below in table 18.

The hydrogeological model developed for Myuna Colliery assumes that the volumes of each of these storages are constant. An annual survey of the water storage areas will be conducted for the Annual Groundwater Management Report to determine whether storage volumes have changed and the hydrogeological model is recalibrated as required.

Table 18 Mine Seam Water Storage Volume

SEAM	WATER STORAGE VOLUME (ML)
Wallarah Seam	740
Great Northern Seam	1407
Fassifern Seam	1326

Myuna Colliery used 154 ML of potable water for the 2015 reporting period of which approximately 95% (or 147 ML) was used for mining operations .

In accordance with the requirements Groundwater Management Plan, the transfer of water from the underground workings to the surface has been monitored daily. The transfer volume for the 2015 report period was 1930 ML.

The passive take has been calculated by subtracting the inflows from the active pumping volume. The passive take for the 2015 report period was 1728.5 ML.

Table 19 Water Balance

Year	Passive Take	Inflows	Active Pumping
2014	1444.1	169.9	1614
2015	1728.5	201.5	1930

Trends

The extraction volumes generally over estimated groundwater inflows into the mine since they also included potable water transfers to the mine. The addition of the pump line for the transfer of surface water to the underground reservoir in 2014 and subsequent upgrade in 2015 increases inflows into the mine.

Visual inspection of the trend, in the Centennial Myuna Annual Groundwater Management Report Figure 4–1(GHD 2015), indicates that extraction from underground workings was decreasing between mid 2013 and 2014. Extraction rates began to increase in 2015.

The annual mine water extraction volumes between 2011 and 2015 are listed in table 20 below.

Table 20 Annual Mine Water Extraction Volumes

YEAR	ANNUAL VOLUME (ML)
2011	2047
2012	2580
2013	2281
2014	1614
2015	1930

EA Predictions

GHD Pty Ltd (GHD) revised the hydrogeological model for Myuna Colliery as part of the preparation of the Northern Operations Regional Water and Salt Balance (GHD, 2014). The original hydrogeological model was developed in 2010 to support the Part 3A project application for Myuna Colliery (GHD, 2010). A three dimensional eight layer numerical hydrogeological model has been constructed to estimate groundwater inflow into the underground workings at Myuna Colliery up to 2200. The results of this modelling have been incorporated into the Centennial Northern Regional Water and Salt Balance.

Hydrogeological modelling was undertaken using the MODFLOW-NWT solver of the MODFLOW 2005 groundwater modelling code. The model was constructed using the GMS graphical user interface with reference to the NSW Aquifer Interference Policy and Australian Groundwater Modelling Guidelines (Barnett et al., 2012). The hydrogeological model was calibrated under transient conditions using available underground water extraction data. The calibrated hydrogeological model was used to provide estimates of future groundwater inflows and dewatering volumes under approved and proposed conditions. The results of the modelling shows the total predicted groundwater inflows into the Myuna workings are predicted to peak at 7.5 ML/day in year 2032. The original hydrogeological model predicted that groundwater inflows would peak at 28.4 ML/day, and 8.3 ML/day would be extracted (GHD, 2010). The original hydrogeological model for Myuna was highly conservative because underground water storage levels were not being monitored and that only a proportion of groundwater inflow was extracted within each seam, resulting in ongoing flooding of some areas of old workings. Therefore, groundwater inflow exceeded extraction from underground workings. As such, overall a conservative model was built due to lack of data of the underground water system. As part of the review and calibration of the hydrogeological model undertaken in 2014, additional information and data was added which included that:

- all groundwater inflow is extracted;
- the extraction of groundwater volumes was actually equal to groundwater inflows; and
- Underground storages are managed to maintain certain levels.

As part of the 2011 EIS for the Myuna Part 3A application, negligible changes in groundwater levels in the shallow alluvial aquifers were predicted during the life of Myuna's operation due to the limited connection between the shallow alluvial aquifers and the deeper coal seam aquifers that were to be affected. It was considered that the variation in groundwater levels in the shallow alluvial aquifers is attributable to changes in rainfall recharge and evaporation. Therefore, impacts on alluvial aquifers, existing alluvial groundwater users and Groundwater Dependent Ecosystems (GDEs) resulting

from the proposed Project would be minimal, and therefore significant impacts to the groundwater environment were not expected.

8. REHABILITATION

The Division of Resources and Energy (DRE) approved (8th October 2013) the Myuna Colliery Mining Operations Plan (MOP) until the 30th June 2015. Myuna Colliery submitted a variation of the MOP to DRE for an extension to the approval date to allow for a transition between the previous EDG03 MOP guidelines and the new ESG03 MOP guidelines. DRE granted approval to the MOP until 31st December 2015.

Myuna Colliery submitted a new Mining Operations Plan to the DRE which was approved 7th December 2015 for the period 1st January 2016 to 30th November 2022.

The rehabilitation performance of Myuna Colliery is measured against the targets outlined in the MOP (2013 – 2015) for the 2015 report period.

There was no rehabilitation activities proposed in the MOP 2013 – 2015 for the report period.

Due to Myuna Collieries minimal foot print mining infrastructure areas will continue to be used throughout the MOP period to facilitate mining operations. There were no rehabilitation activities undertaken during the report period.

No buildings were renovated, removed or rehabilitated during the report period.

8.1. Next Reporting Period

The rehabilitation performance of Myuna Colliery for the next reporting period will be measured against the targets outlined in the currently approved MOP (2016 – 2022).

The active disturbance area was increased by 5 hectares from the previous MOP to the current MOP with the inclusion of areas previously not identified as requiring rehabilitation. Specifically an increase in area around the downcast shaft (Domain 3) and the inclusion of the lower field area (Domain 4).

All surface infrastructure associated with Myuna Colliery's operations is located at the Surface Facilities Area. The Surface Facilities Area encompasses a footprint of approximately 89 hectares, of which 25.2 hectares includes the surface infrastructure. These 25.2 hectares is the total area currently requiring rehabilitation prior to mine closure. The remainder of the Surface Facilities Area is predominantly natural bushland vegetation, the Wangi Creek watercourse and existing cleared easement corridors.

Final landform creation and rehabilitation activities will largely be undertaken following the completion of mining. Centennial Myuna will redevelop the existing Myuna Colliery Site for light industry based land uses. The area of the downcast shaft will be rehabilitated to natural bush land.

There are no proposed rehabilitation trials or research projects to be undertaken in the next report period.

There is no rehabilitation activities proposed for the next report period.

Table 21 Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)

	2014 (ha)	2015 (ha)	2016 (ha)
A. Total mine footprint[1]	6500	7426.5	7426.5
B. Total active disturbance[2]	20.2	25.2	25.2
C. Land being prepared for rehabilitation[3]	Nil	Nil	Nil
D. Land under active rehabilitation[4]	Nil	Nil	Nil
E. Completed rehabilitation[5]	Nil	Nil	Nil

9. COMMUNITY

Centennial Myuna operates under a Stakeholder Engagement Plan, and continues to support the local community through various sponsorship schemes. The following is the sponsorship and support carried out locally during the calendar year:

- Myuna Colliery was a major sponsor of the Wangi Dobell Festival of Arts and Crafts 2015 hosted by the Wangi Lions Club;
- Myuna Colliery was major sponsor of the Wangi Amateur Sailing Club events the Centennial Coal Australia Day Regatta and the Youth sail Lake Macquarie Regatta.

Centennial Myuna supported corporate sponsorships for local sporting organisations, with sponsorship assistance for new equipment and operational costs. These sporting clubs include Rathmines memorial Bowling Club, Toronto Awaba Junior Soccer Club, Westlakes Districts Netball Association, Southern Lakes Cricket Club, Macquarie Scorpions Rugby League Club.

Centennial Myuna supported corporate sponsorship for community organisations and events including Meals on Wheels, Hunter Research Foundation, Hunter Valley Training Company, Toronto Bridge Club, Wangi Public School, Toronto Chamber of Commerce, Wallsend Public School, Lara Jean Association, Retired Mine Workers Association, Westlakes Senior Computer Club, Rotary Newcastle Enterprise, Northern NSW Sabot Sailing, Rotary Club of Toronto Sunrise.

Community Complaints

A community complaints register is kept on site. All community enquiries and complaints received by Myuna Colliery are to be recorded as per MY-EWP-038 Community

[1] **Total Mine Footprint:** includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities. As such it is the sum of total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in the DRE MOP/RMP Guidelines). Please note that subsidence remediation areas are excluded.
[2] **Total Active Disturbance:** includes all areas requiring rehabilitation
[3] **Land being prepared for rehabilitation:** includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DRE MOP/RMP Guidelines)
[4] **Land under active rehabilitation:** includes areas under rehabilitation and being managed to achieve relinquishment – includes 'ecosystem and land use establishment' and 'ecosystem and land use sustainability (as defined under the DRE MOP/RMP Guidelines)
[5] **Completed rehabilitation**: requires formal sign off from DRE that the area has successfully net the rehabilitation land use objectives or completion criteria

Complaint and Enquiries Procedure. This information is then entered into the Centennial Coal Environment and Community Database (ECD).

There was no community complaints received in the 2015 report period.

10. INDEPENDENT AUDIT

Independent Environmental Audit

In accordance with condition nine of Project Approval 10_0080 MOD1 Centennial Myuna will engage an independent expert, approved by the Department of Planning, to undertake an Independent Environmental Audit. The audit will be undertaken during the next reporting period.

Audit of Groundwater Conditions

In accordance with condition six of Bore Licence 20BL172565 Centennial Myuna will engage an independent expert, approved by the Office of Water, to undertake an audit of the groundwater conditions, all monitoring records and any related impacts. The audit will be undertaken during the next reporting period.

There were no independent audits conducted during the report period.

11. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

Table 22 Access to Information

Nature of the incident/non-compliance	Failure to comply with PA10_0080 schedule 5 condition 11 access to information.
Date of incident/ non-compliance (if known; if not known state not known)	10/09/2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Centennial Coal web site
Detail the cause of the incident/non-compliance	The Complaints register had not been uploaded to the Centennial Coal website for public access.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Complaints register was uploaded to the web site 15th September 2015.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	An internal audit of publicly available documents will be conducted annually.

Table 23 Requirement to monitor volume

Nature of the incident/non-compliance	Non compliance with EPL366 condition M8 Requirement to monitor volume.
Date of incident/ non-compliance (if known; if not known state not known)	22nd – 27th January 2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Licence Discharge Point B
Detail the cause of the incident/non-compliance	Power outage due to battery failure on the real time monitor.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	There are no adverse environmental effects as a result of the technical non compliance.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	The LDP B real time water quality and flow monitor is monitored daily.

Table 24 Water Concentration Limit

Nature of the incident/non-compliance	Exceedance of EPL 366 TSS concentration limit criteria.
Date of incident/ non-compliance (if known; if not known state not known)	2nd April 2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Licence Discharge Point B
Detail the cause of the incident/non-compliance	The presence of organic matter, the absence of fine coal particles and the real time monitoring data would indicate that the sample was contaminated during the sample collection by the disturbance of algal growth and vegetation in the base of the water channel.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	An inspection of the area was completed immediately following the incident. There were no adverse effects identified.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	In order to prevent a recurrence of this event sampling methods were reviewed and personnel involved in sample collection were required to undertake refresher training in sample collection.

Table 25 Water Concentration Limit

Nature of the incident/non-compliance	Exceedance of EPL 366 TSS concentration limit criteria.

Date of incident/ non-compliance (if known; if not known state not known)	4th April 2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Licence Discharge Point B
Detail the cause of the incident/non-compliance	The CHP dam had insufficient capacity to control surface run off from the storm and overflowed into the clean water dams.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	An inspection of the area was completed immediately following the incident. There were no adverse effects identified.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Significant improvements in the water management system have been achieved by increasing the rate of transfer (approximately 10L/sec to 50L/sec) from the dam to the underground settlement reservoir. This has been achieved by the addition of a larger pipe line to the automated pumping system and the construction of a syphon line from the CHP dam to an underground reservoir via a borehole.

Table 26 Water Concentration Limit

Nature of the incident/non-compliance	Exceedance of EPL 366 volume limit criteria.
Date of incident/ non-compliance (if known; if not known state not known)	21st April 2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Licence Discharge Point B
Detail the cause of the incident/non-compliance	Large storm event caused a high volume of surface water run off. Power outage caused a pump system failure and telecommunication failure. The pump failure prevented water being pumped to the under ground reservoir. The failure of the real time monitoring led to less than adequate information to manage the volume at discharge.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	An inspection of the area was completed immediately following the incident. There were no adverse effects identified.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Significant improvements in the water management system have been achieved by increasing the rate of transfer (approximately 10L/sec to 50L/sec) from the dam to the underground settlement reservoir. This has been achieved by the addition of a larger pipe line to the automated pumping system and the

	construction of a syphon line from the CHP dam to an underground reservoir via a borehole.

Table 27 Volume Limit

Nature of the incident/non-compliance	Exceedance of EPL 366 TSS concentration limit criteria.
Date of incident/ non-compliance (if known; if not known state not known)	22nd May 2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Licence Discharge Point B
Detail the cause of the incident/non-compliance	The CHP dam had insufficient capacity to control surface run off from the storm and overflowed into the clean water dams.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	An inspection of the area was completed immediately following the incident. There were no adverse effects identified.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Significant improvements in the water management system have been achieved by increasing the rate of transfer (approximately 10L/sec to 50L/sec) from the dam to the underground settlement reservoir. This has been achieved by the addition of a larger pipe line to the automated pumping system and the construction of a syphon line from the CHP dam to an underground reservoir via a borehole.

Table 28 Requirement to Monitor Noise

Nature of the incident/non-compliance	EPL366 condition M4 Requirement to monitor noise, (f) Each quarterly monitoring period must be undertaken on a different day of the week not including Saturdays, Sundays and Public Holidays.
Date of incident/ non-compliance (if known; if not known state not known)	Monday 23rd March and Monday 29th June. Tuesday 24th March and Tuesday 30th June.
The location of the incident/ non-compliance (include a figure if appropriate), if known	Noise monitoring receivers R1 to R8.
Detail the cause of the incident/non-compliance	The consultant undertaking the noise monitoring had interpreted the reporting period to be from the date of issue of the new condition in the Licence variation.

Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	There are no adverse environmental effects as a result of the technical non compliance.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	The day of the week the noise monitoring has been undertaken will be tabled in each quarterly noise monitoring report for the report period.

Table 29 Summary of Reportable Incidents and Regulatory Actions

Compliance Type	Agency	Number	Response
Incidents	Not relevant	3	1
Caution Notices		Nil	
Warning Letters		Nil	
Penalty Notices		Nil	
Prosecutions		Nil	

Note: This table includes actions taken by DPE, DRE and the EPA during the reporting period.

Reportable Incident 1

Centennial Myuna provided written notification to the Environment Protection Authority (EPA) in accordance with Condition R2.2 of Environmental Protection Licence (EPL) 366, of discharges from LDP B into Wangi Creek on Thursday 2nd April, Saturday, 4th April and Friday 22nd May 2015.

On Thursday, 2 April 2015 the concentration of total suspended solids (TSS) exceeded the limit criteria set out in Condition L2 of EPL366 for LDP B. TSS was recorded at 60mg/l from LDP B.

The solid matter collected in the sample was analysed by the Hunter Water Corporation Laboratory as organic (algae and plant matter). The real time monitoring of parameters turbidity, pH, Ec and temperature has been undertaken at LDP B since July 2013. Turbidity recorded at LDP B on the 2nd April ranged from a minimum of 15 NTU to 18 NTU.

The presence of organic matter, the absence of fine coal particles and the real time monitoring data would indicate that the sample was contaminated during the sample collection by the disturbance of algal growth and vegetation in the base of the water channel.

In order to prevent a reoccurrence of this event personnel involved in sample collection will undergo refresher training.

Reportable Incident 2

On Saturday, 4th April 2015 the concentration of TSS exceeded the limit criteria set out in Condition L2 of EPL366 for LDP B. TSS was recorded at 63mg/l from LDP B. The estimated duration of the discharge was calculated from the LDP B real time monitoring data. The duration of the discharge was estimated to be from 7.50am to 3.10 pm.

The Myuna Colliery meteorological station recorded rainfall of 106 mm for the 4th April 2015. 67.8mm of rainfall was recorded for the 24 hours preceding the sample collection.

Daily sampling taken by the independent sampler Carbon Based was taken at 9:30am on the 4th of April. Field notes taken by Carbon Based noted that the water sample was clear in colour with no indication of potential environmental harm or pollution therefore not triggering immediate reporting.

Reportable Incident 3

On Friday, 22nd May 2015 during a storm event the concentration of TSS exceeded limit criteria set out in Condition L2 of EPL366 for LDP B. TSS was recorded at 70mg/l from LDP B. The estimated duration of the discharge was calculated from the LDP B real time monitoring data. The duration of the discharge was estimated to be from 10.50am to 2.20 pm.

The Myuna Colliery meteorological station recorded rainfall of 62 mm for the 22nd May 2015. 40mm of rainfall was recorded for the 4 hours preceding the sample collection.

Daily sampling taken by the independent sampler Carbon Based was taken at 12:25pm on the 22nd of May. Field notes taken by Carbon Based noted that the water sample was clear in colour with no indication of potential environmental harm or pollution therefore not triggering immediate reporting.

The EPA made a request, dated 11th September 2015, for further information regarding rainfall data and the dam storages design capacity.

Myuna Colliery provided to the EPA the raw rainfall data for the 22nd and 23rd May, the calibration certificates for the meteorological station and the dam storage design capacity.

Summary of Actions

Table 30 Actions Summary

Incident	Actions
Failure to provide public access to document	An internal audit of publicly available documents will be conducted annually.
Failure to monitor continuously	Operation of real time monitor checked daily.
Exceedance of TSS limit criteria	Review sample collection procedure. Personnel undertook refresher training in sample collection. Increase in the size of the pipe line from the automated pumping system at the CHP dam. Construction of a syphon line from the CHP dam to an underground reservoir via a borehole.
Exceedance of volume limit criteria	Construction of a manually operated syphon line from the CHP dam to an underground reservoir via a borehole.
Failure to comply with condition on monitoring schedule	Tabled schedule to be included in Monitoring report.

12. ACTIVITES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Hydrocarbon Investigation

DPE conducted a detailed site inspection of Myuna Colliery 19th August 2015. The purpose of the inspection was to review compliance with environmental requirements of relevant approval instruments including the Mining Lease, Mining Operation Plan (MOP) and Annual Environmental Management Report (AEMR).

DPE correspondence received 10th September 2015 outlines the actions required following the report review and site inspection. DPE advised "the wash down sediment sump above the CHP dam contained visible hydrocarbon. As this water is transferred to the underground workings it is recommended that a need for a system to remove hydrocarbons from this water be investigated."

An action plan was developed for the hydrocarbon investigation. The following actions have been completed:

- Analyse water samples to confirm hydrocarbon presence; and
- Identify the source of the hydrocarbons.

Water samples were collected from the CHP sump and analysed for oils over a six week period. The results confirmed low levels of oils present in the CHP sump. The maximum concentration of oils present in the water was 8mg/L. The average from four samples collected was 5mg/L. All results have been below the EPL366 limit criteria for oils at LDP B.

The source of the hydrocarbons was identified as the oil water separator at the wash down bay. Further investigations will be undertaken to determine how to eliminate the source of the hydrocarbon contamination.

Phase 2 Site Assessment

A Phase 2 Environmental Site Assessment (ESA) was conducted, by AECOM 2013, subsequent to the decommissioning by foam filling of the Underground Petroleum Storage Systems (UPSS) infrastructure. The objective of the Phase 2 ESA was to assess the presence of soil, sediment, surface water and ground water contaminations in targeted areas identified as areas of potential concern within the Site and determine Centennials remedial obligations.

The targeted Phase 2 ESA identified on-site Phase separated hydrocarbons, soil and ground water impact and off-site sediment and surface water impact related to historic and current Site mining operations, which under the Contaminated Land Management Amendment Act 2008 triggered the duty to report to the NSW EPA. The extent and associated risk of the impact was not evaluated and therefore it had not been determined if remedial action was required or not.

Centennial Coal had reported Myuna Colliery to the EPA in a letter dated 2nd February 2012. The EPA responded to Centennial acknowledging receipt of the Duty To Report letter and Centennials commitment to for staged investigation and remediation works at its mine sites.

EPA officers conducted a site inspection 29th June 2015 for the purpose of reviewing the information provided from the Section 60 Duty to report and the Phase 2 Environmental Assessment.

Centennial Myuna set aside provisions in the 2016 budget to undertake the recommendations of the Targeted Phase 2 Environmental Site Assessment (AECOM 2013).

A scope of work has been developed in accordance with the recommendations of the Targeted Phase 2 Environmental Assessment.

The Scope of Work is provided below:

- Installation and development of new targeted monitoring ground water wells.
- Initial gauging of the ground water wells onsite
- Undertake a comprehensive hydraulic investigation (including determining the transmissivity of the identified PSH), including but not limited to the assessment of the hydraulic gradient of the groundwater to identify the potential for the PSH and the impacted groundwater to migrate off-site towards Wangi Creek and/or Lake Macquarie.
- Delineate the extent of the PSH plume and petroleum hydrocarbon impacted groundwater, further downgradient of the decommissioned USTs and towards Wangi Creek.
- Document the nature and location of the identified PSH, TPH impacted soils and groundwater across the Site in Centennial's Environmental Management Plan (EMP) so that all necessary precautions are taken to ensure that any intrusive works for maintenance or otherwise is undertaken in a manner that protects and mitigates harmful exposure to workers.
- Undertake a Human Health and Ecological Risk Assessment (HHERA) in order to assess the potential human health risk associated with vapor intrusion into the office block/bath house from the identified PSH and TPH solute plumes and the potential ecological and secondary human health risk associated with the metal impact migrating from the site to natural water bodies.
- Report on the findings of the above investigations.

A site action plan has been implemented with the work to be undertaken scheduled to be completed in the next reporting period.

Centennial Coal

Centennial Coal Company Limited
P O Box 1000
Toronto NSW 2283
www.centennialcoal.com.au

APPENDICES

APPENDIX 1 Myuna Colliery Development Consent SH 110/148

DC. SH. 110/148
99

21st December, 1977.

The Secretary
Newcom Colliery Pty. Ltd.,
Box 293, G.P.O.,
SYDNEY. 2001

Dear Sir

Wangi Wangi and Dora Creek
Environmental Impact Statement

Council at its meeting of the 15th December 1977 resolved that you be advised that Council consents to the development of Myuna and Cooranbong Collieries as described in the Environmental Impact Statement subject to the following conditions:

(a) that Newcom Colliery comply with the conditions set down by the State Pollution Control Commission,

(b) that the company submit to Council for approval landscape plans for the two collieries.

(c) That the Company upgrade and seal the access road from Dora Creek to Cooranbong Colliery including any necessary upgrading of drainage structures and that this work be carried out to Council's satisfaction,

(d) That the Company widen and upgrade the intersection of Main Road No. 217 Wamsley Street and Dora Street to Council's satisfaction,

(e) That under no circumstances is there to be any coal transport by road from these collieries or from the coal storage areas at Eraring and Wangi Power Stations except between Myuna Colliery and the temporary storage area at Wangi Power Station,

(f) That the company widen the junction of the access road to Myuna Colliery and Wangi Point Road to Council's satisfaction.

In respect of the landscaping plan I would be pleased if your Company's representative would liaise with Council's Mr. M. Peterson, the Environmental Officer.

Further information concerning the construction of road works could be obtained from the Municipal Engineer, Mr. I. Aldomas.

Yours faithfully,

TOWN CLERK

APPENDIX 2 Myuna Colliery Project Approval 10_0080 MOD1

Project Approval

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

As delegate for the Minister of Planning and Infrastructure, the Planning and Assessment Commission of New South Wales (the Commission) approves the project application 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.

RED TYPE – MOD 1 FEB 2015

Member of the Commission **Member of the Commission**

Sydney 2012

SCHEDULE 1

Application Number:	10_0080
Proponent:	Centennial Myuna Pty Limited
Approval Authority:	Minister for Planning and Infrastructure
Land:	See Appendix 1
Project:	Myuna Colliery Mining Project

TABLE OF CONTENTS

DEFINITIONS

Adaptive management	Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mine plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within the predicted and/or designated ranges and in compliance with the conditions of this approval
Annual Review	The review required by Condition 4 of Schedule 5
Approval	This Project Approval
BCA	Building Code of Australia
Benthic communities	Aquatic flora and fauna assemblages that live on or in the bottom of the lake
Built features	Includes any building or work erected or constructed on land, and includes dwellings and infrastructure such as any formed road, street, path, walk, or driveway; and any pipeline, water, sewer, telephone, gas or other service main
CCC	Community Consultative Committee
Conditions of this approval	Conditions contained in Schedules 2 to 5 inclusive
Construction	The demolition of buildings or works, carrying out of works and erection of buildings covered by this approval
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Environment
~~Department~~	~~Department of Planning and Infrastructure~~
~~Director-General~~	~~Director-General of the Department, or delegate~~
~~DPI (Fisheries)~~	~~Fisheries Division of the Department of Primary Industries~~
DRE	Division of Resources and Energy in the Department of Trade and Investment, Regional Infrastructure and Services
DSC	Dams Safety Committee
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services
EA	Environmental Assessment titled '*Myuna Colliery Extension of Mining Environmental Assessment',* dated February 2011, and associated response to submissions titled '*Myuna Colliery Extension of Mining Project – Response to Submissions',* dated September 2011.
EA (MOD 1)	Modification Application 10_0080 MOD 1, accompanying Environmental Assessment titled *Environmental Assessment Myuna Colliery Section 75W Modification to Project Approval PA 10_0080* prepared by Centennial Coal Company Limited and dated November 2014 and the Response to Submissions document dated January 2015
Emergency Day	The day-time noise assessment period when the Emergency Coal Stockpile is in use
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 POEO Act
Environmental consequences	The environmental consequences of subsidence impacts, including: damage to built features; loss of surface water flows to the subsurface; loss of standing pools; adverse water quality impacts; cliff falls; rock falls; damage to Aboriginal heritage sites; impacts on aquatic ecology; and ponding.
Evening	The period from 6pm to 10pm
Executive Director Mineral Resources	Executive Director Mineral Resources within DRE, or the equivalent role
Existing strategies, plans or programs	Any strategy, plan or program described in the EA as existing.
Feasible	Feasible relates to engineering considerations and what is practical to build or to implement
First workings	Extraction of coal by bord and pillar workings and the like
Fisheries NSW	NSW Fisheries division of the Department of Primary Industries
Heritage Item	An item as defined under the *Heritage Act 1977* and/or an Aboriginal object or Aboriginal place as defined under the *National Parks and Wildlife Act 1974*
High Water Level Subsidence Control Zone	The area of land shown in Appendix 2 and defined: a) on the surface by the highwater level of Lake Macquarie and a point 2.44 metres in elevation above that highwater level; and b) in the seam, where it is intersected by lines: • drawn landwards from all points 2.44 metres elevation above the highwater level of Lake Macquarie; and • drawn lakewards from the highwater level of Lake Macquarie, at an angle of 35 degrees from the vertical.
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this approval

INP	NSW Industrial Noise Policy
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in schedules 3 and 4 of this approval where it is defined to mean 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
LMCC	Lake Macquarie City Council
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mining operations	Includes all extraction, processing, handling, storage and transportation of coal carried out on the site
~~Minister~~	~~Minister for Planning and Infrastructure, or delegate~~
Minister	Minister for Planning
Minor	Not very large, important or serious
Mitigation	Activities associated with reducing the impacts of the project prior to or during those impacts occurring
MSB	Mine Subsidence Board
Negligible	Small and unimportant, such as to be not worth considering
Night	The period from 10pm to 7am, Monday to Saturday, 10pm to 8am on Sundays and Public Holidays
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or a mining company (or its subsidiary)
Project	The project described in the EA
Proponent	Centennial Myuna Pty Limited, or any other person or persons who rely on this approval to carry out the development that is subject to this approval
Reasonable	Reasonable relates to the application of 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
Reasonable costs	The costs agreed between the Department and the Proponent for obtaining independent experts to review the adequacy of any aspects of the extraction plan, or where such costs cannot be agreed, the costs determined by a dispute resolution process
Rehabilitation	The treatment or management of land disturbed by the project for the purpose of establishing a safe, stable and non-polluting environment.
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the projects or controlling the environmental consequences of this impact.
ROM coal	Run-of-mine coal
Safe, serviceable and repairable	Safe means no danger to users who are present, serviceable means available for its intended use, and repairable means damaged components can be repaired economically
Second workings	Extraction of coal by pillar extraction methods
Secretary	The Secretary of the Department, or nominee
Site	All land to which the project application applies, including the surface facilities sites, as listed in Appendix 1 and generally shown in Appendix 3
SMP	Subsidence Management Plan
Statement of Commitments	The Proponent's commitments in Appendix 4
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts
Subsidence effects	Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature
Subsidence impacts	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs
Surface facilities sites	The Myuna Colliery surface facilities site; all ventilation shaft sites; surface sites used for gas drainage or for other mining purposes infrastructure; and any other site subject to existing or proposed surface disturbance associated with the project
WSC	Wyong Shire Council
Zone A	The area at the site that includes: • all land above 2.44 m in elevation above the high water level at Lake Macquarie; • the High Water Level Subsidence Control Zone; and • seagrass beds in Lake Macquarie.
Zone B	The bed of Lake Macquarie excluding those areas within Zone A.

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this approval, the Proponent shall 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 shall carry out the project generally in accordance with the:
   (a) EA;
   (b) EA (MOD 1)
   (c) Statement of Commitments; and
   (d) conditions of this approval.

   Notes:
   - *The general layout of the project is shown in Appendix 3; and*
   - *The statement of commitments is reproduced in Appendix 5.*

3. If there is any inconsistency between the above documents, the most 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 shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this approval; and
   (b) the implementation of any actions or measures contained in these documents.

LIMITS ON APPROVAL

Mining Operations

5. The Proponent may carry out mining operations on the site until 31 December 2032.

   Note: Under this approval, the Proponent is required to rehabilitate the site and perform additional undertakings to the satisfaction of both the Secretary and the Executive Director Mineral Resources. Consequently, this approval will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Extraction and Transport

6. The Proponent shall not:
   (a) extract more than 3 million tonnes of ROM coal from the site in any calendar year.
   (b) transport any coal on public roads.

7. The Proponent shall ensure that all coal is transported from the site via the enclosed overland coal conveyer to Eraring Power Station.

Hours of Operation

8. The Proponent may undertake mining operations 24 hours a day, 7 days a week.

STRUCTURAL ADEQUACY

9. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structure, that are part of the project are constructed in accordance with:
   (a) the relevant requirements of the BCA; and
   (b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.

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

DEMOLITION

10. The Proponent shall 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

11. The Proponent shall ensure that all the plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS

12. With the approval of the Secretary, the Proponent may submit any strategies, plans or programs required by this approval on a progressive basis.

Notes:

- *While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and*
- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

CONTINUATION OF EXISTING MANAGEMENT PLANS

13. The Proponent shall continue to implement existing strategies, plans or programs that apply to existing activities on the site until they are replaced by an equivalent strategy, plan or program approved under this approval.

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

SUBSIDENCE

1. The Proponent shall ensure that vertical subsidence within Zone A is limited to a maximum of 20 millimetres (mm) and that extraction methods are limited to first workings only.

2. The Proponent shall ensure that vertical subsidence within Zone B is limited to 650 mm and second workings are limited to partial pillar extraction within the Great Northern and Fassifern coal seams.

3. The Proponent shall seek approval from the DSC prior to mining within the Eraring Dam Notification Area.

Environmental Performance Measures

4. The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 1, to the satisfaction of the Secretary.

Table 1: Environmental Subsidence Impact Performance Measures

Biodiversity	
Threatened species, populations or their habitats and endangered ecological communities	Negligible impact or environmental consequences.
Seagrass beds	Negligible environmental consequences including: • *negligible* change in the size and distribution of seagrass beds; • *negligible* change in the functioning of seagrass beds; and • *negligible* change to the composition or distribution of seagrass species within seagrass beds.
Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.

Notes:

- *The Proponent will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this approval (see condition 8, below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.*

Offsets

5. If the Proponent exceeds the performance measures in Table 1 and the Secretary determines that:
   (a) it is neither reasonable nor feasible to remediate the impact or environmental consequence; or
   (b) remediation measures implemented by the Proponent have failed to satisfactorily remediate the impact or environmental consequence;

   then the Proponent shall provide a suitable offset to compensate for the impact or environmental consequence, to the satisfaction of the Secretary.

   Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.

Built Features Performance Measures

6. The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 2, to the satisfaction of the Secretary.

Table 2: Built Features Subsidence Impact Performance Measures

Built Features	
Key public infrastructure: Eraring Power Station Ash Dam	Negligible impact or consequence.
Other public infrastructure (including sewage pipes; power and telecommunications cables). Other built features (including jetties and boat moorings)	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repaired, replaced or fully compensated.
Public Safety	
Public Safety.	Negligible additional risk.

Notes:

- *The Proponent will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this approval (see condition 8 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.*
- *The requirements of this condition only apply to the impacts and consequences of mining operations undertaken following the date of this approval.*
- *Requirements regarding safety or serviceability do not prevent preventative or mitigatory actions being taken prior to or during mining in order to achieve or maintain these outcomes.*

7. Any dispute between the Proponent and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 2 is to be settled by the Secretary, following consultation with the MSB and the Executive Director Mineral Resources. Any decision by the Secretary shall be final and not subject to further dispute resolution under this approval.

Extraction Plan

8. The Proponent shall prepare and implement an Extraction Plan for all second workings on site to the satisfaction of the Secretary. This plan must:
   (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;
   (b) be approved by the Secretary before the Proponent carries out any of the second workings covered by the plan;
   (c) include detailed plans of existing and proposed first and second workings and any associated surface development;
   (d) include detailed performance indicators for each of the performance measures in Tables 1 and 2;
   (e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this approval;
   (f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 1 and 2; and manage or remediate subsidence impacts and/or environmental consequences;
   (g) include a Benthic Communities Management Plan, which has been prepared in consultation with OEH, Fisheries NSW and LMCC, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities in Zone B, and which includes:
      - surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured;
      - benthic species surveys within Zone B, as well as control sites outside Zone B (at similar depths) to establish baseline data on species number and composition within the communities;
      - a program of ongoing seasonal monitoring of benthic species in both control and impact sites; and
      - development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the survey data collected;
   (h) include a Seagrass Management Plan, which has been prepared in consultation with OEH, Fisheries NSW and LMCC, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on seagrass beds, and which includes:
      - identification of all seagrass beds (whether established before or after the date of this approval) which may be affected by the proposed second workings;
      - delineation of seagrass beds at the edge of Zone A that may experience subsidence effects from second workings in Zone B;
      - a program of ongoing monitoring of seagrasses in both control and impact sites; and

- a program to predict and manage subsidence impacts and environmental consequences to seagrass beds to ensure the performance measures in Table 1 are met;

(i) include a Built Features Management Plan, which has been prepared in consultation with DRE, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings on built features, and which:
- addresses in appropriate detail all items of key public infrastructure and other public infrastructure and all classes of other built features;
- has been prepared following appropriate consultation with the owner/s of potentially affected feature/s;
- recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate for predicted impacts on potentially affected built features in a timely manner; and
- in the case of all key and other public infrastructure, reports external auditing for compliance with ISO 31000 (or alternative standard agreed with the infrastructure owner) and provides for annual auditing of compliance and effectiveness during secondary extraction which may impact the infrastructure;

(j) include a subsidence monitoring program, which has been prepared in consultation with DRE, OEH, and Fisheries NSW, to:
- provide data to assist with the management of the risks associated with subsidence;
- validate the subsidence predictions;
- analyse the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and
- inform the contingency plan and adaptive management process;

(k) include a Public Safety Management Plan, which has been prepared in consultation with DRE, to ensure public safety in the mining area;

(l) include a Strata Management Plan which has been prepared in consultation with DRE;

(m) propose appropriate revisions to the Rehabilitation Management Plan required under condition 35 of Schedule 4;

(n) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 1 and 2, or where any such exceedance appears likely; and

(o) include a program to collect sufficient baseline data for future Extraction Plans.

Notes: *1) An SMP which is approved by DRE prior to 30 October 2012 is taken to satisfy the requirements of this condition.*
2) The Benthic Communities and Seagrass Management Plans may be prepared jointly with similar plans required for any adjacent colliery.

First Workings

9. The Proponent may carry out first workings within the site, other than in accordance with an approved Extraction Plan, provided that DRE is satisfied that the first workings are designed to remain stable and non-subsiding, except insofar as they may be impacted by approved second workings.

Note: *The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with zero resulting subsidence impacts.*

Payment of Reasonable Costs

10. The Proponent shall pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent persons to review the adequacy of any aspect of an Extraction Plan.

NOISE

Noise Criteria

11. The Proponent shall ensure that the noise generated by the project does not exceed the criteria in Table 3 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 3: Noise criteria dB(A)

Location	***Day***	***Emergency Day***	***Evening***	***Night***	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
R1, R2 and R3 Summerhill Drive and Wangi Close, Wangi Wangi	35	40	35	35	45
R4, Donnelly Road, Arcadia Vale	35	44	40	38	49
R5, R6, R7 and R8 Donnelly Road, Arcadia Vale	37	44	42	39	49
All other privately-owned land	35	40	35	35	45

Notes:

- *Emergency Day noise limits only apply during the Day period when the Eraring Power Station overland conveyor is not in operation and the project's Emergency Coal Stockpile must be used.*
- *To identify the locations referred to, see the figure in Appendix 3.*
- *Noise generated by the project is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the INP.*

However, these criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Operating Conditions

12. The Proponent shall implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction and operational noise generated by the project.

Noise Management Plan

13. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be submitted for approval to the Secretary within 7 months of the date of this approval;
    (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval;
    (c) outline procedures to manage responses to any complaints or issues raised by the owners of affected residences; and
    (d) include a noise monitoring program that:
        - uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the project; and
        - includes a protocol for determining exceedances of the relevant conditions of this approval.

Construction Noise

14. The Proponent shall limit construction activities to 7am – 6pm weekdays and 8am to 1pm Saturdays with no construction operations on Sundays or Public Holidays. Construction noise shall be managed in accordance with EPA's *Interim Construction Noise Guideline 2009.*

AIR QUALITY & GREENHOUSE GAS

Odour

15. The Proponent shall ensure that no offensive odours, as defined under the POEO Act, are emitted from the site.

Greenhouse Gas Emissions

16. The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site, to the satisfaction of the Secretary.

Air Quality Criteria

17. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria listed in Tables 4, 5 or 6 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 4: Long-term criteria for particulate matter

Pollutant	Averaging Period	[d] Criterion
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 5: Short-term criterion for particulate matter

Pollutant	Averaging Period	[d] Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 6: Long-term criteria for deposited dust

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 4-6:

- [a] *Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);*
- [b] *Incremental impact (ie incremental increase in concentrations due to the project on its own);*
- [c] *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.*
- [d] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with OEH.*

Operating Conditions

18. The Proponent shall implement best practice air quality management on site, including all reasonable and feasible measures to minimise off-site odour, fume and dust emissions generated by the project.

Air Quality and Greenhouse Gas Management Plan

19. The Proponent shall prepare and implement an Air Quality & Greenhouse Gas Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with EPA, and submitted for approval to the Secretary within 7 months of the date of this approval;
    (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, including the proposed air quality management system;
    (c) include an air quality monitoring program, that:
        - uses a combination of volumetric sampling and dust deposition gauges to evaluate the performance of the project;
        - monitors greenhouse gas emissions, particularly methane; and
        - includes a protocol for determining exceedances with the relevant conditions of this approval;
    (d) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site, particularly methane.

METEOROLOGICAL MONITORING

20. During the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the Myuna surface facilities site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
    (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *INP*.

SOIL AND WATER

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Proponent is required to obtain the necessary water licences for the project.

Surface Water Discharges

21. The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits (both volume and quality) set for the project in any EPL.

Water Management Plan

22. The Proponent shall prepare and implement a Water Management Plan for the surface facilities sites to the satisfaction of the Secretary and in consultation with NOW, DRE, and LMCC. This plan must:
    (a) be prepared by suitably qualified and experienced persons whose appointment has been approved by the Secretary;
    (b) be submitted for approval to the Secretary within 7 months of the date of this approval; and
    (c) include:
        - a Site Water Balance;
        - an Erosion and Sediment Control Plan.
        - a Surface Water Management Plan;
        - a Groundwater Monitoring Program; and
        - a Surface and Ground Water Response Plan.

23. The Site Water Balance must:
    (a) include details of:
        - sources and security of water supply;
        - water use on site;
        - water management on site;
        - any off-site water transfers;
        - groundwater transfers from the underground operations to the surface; and
    (b) investigate and implement all reasonable and feasible measures to minimise potable water use from the town water supply and to reuse and recycle water.

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

25. The Surface Water Management Plan must:
    (a) include detailed baseline data on surface water flows and quality of Wangi Creek;
    (b) provide a geomorphic description of Wangi Creek up and downstream of the mine water discharge point;
    (c) detail surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts;
    (d) provide a program to monitor:
        - surface water discharges from the surface facilities sites;
        - stream health, channel stability, water flows and water quality within Wangi Creek; and
        - water quality of Lake Macquarie;
    (e) investigate mitigation and management measures to prevent/limit any incision and degradation of the channel of Wangi Creek from mine discharge water;
    (f) include a detailed review of water management at the Myuna Colliery surface facilities site, with particular reference to the water storages within the dirty water management system and in consultation with EPA, to:
        - determine whether the capacity, integrity, retention time and management of the dirty water storages (particularly the CHP Dam) are sufficient to ensure that water discharged from the site meets all relevant ANZECC water quality criteria, including for metals and suspended solids;
        - assess all reasonable and feasible options for reducing salt load and/or salt concentration for discharges into Wangi Creek;
        - assess appropriate options to improve storage and retention times in accordance with *The Blue Book - Managing Urban Stormwater (MUS): Soils and Construction* (Landcom); and
        - propose upgrades of the dirty water storages sufficient that discharges meet all relevant ANZECC criteria; and
        - propose any other appropriate changes to the water management system; and
    (g) identify and assess practical measures to minimise potable water consumption, maximise recycled water use and improve the management of sewage and surface rainfall runoff for the project, including quantifying the abatement potential of identified measures and their related costs and benefits.

    Note: The Secretary may require the Proponent to implement upgrades and other changes identified under paragraph (f), in accordance with condition 4 of schedule 2. EPA may also require measures to be implemented under the terms of the site's environment protection licence.

26. The Groundwater Monitoring Program must include:
    (a) baseline data of groundwater levels (including alluvial and weathered rock aquifers), yield and quality in the region, and any privately owned groundwater bores that may be affected by mining operations on site;
    (b) groundwater assessment criteria based upon analysis of baseline data for groundwater, surface water, including trigger levels for investigating any potentially adverse groundwater impacts; and
    (c) a program to monitor and/or validate the impacts of the project of alluvial and coal seam aquifers, any groundwater bores.

27. The Surface and Ground Water Response Plan must describe what measures and/or procedures would be implemented to:
    (a) respond to any exceedances of the surface water, stream health, and groundwater assessment criteria; and
    (b) mitigate and/or offset any adverse impacts on riparian vegetation located within and adjacent to the site.

BIODIVERSITY

28. The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:
    (a) submitted to the Secretary within 7 months of the date of this approval;
    (b) be prepared by a suitable qualified ecologist approved by the Secretary;
    (c) have a particular focus on measures that would be implemented over the life of the mine to protect and enhance the *Swamp Sclerophyll Forest on Coastal Floodplains* endangered ecological community near Wangi Creek; and
    (d) include a detailed description of the measures that would be implemented over the life of the mine to ensure that native vegetation and habitat within the surface facilities sites (particularly the *Swamp Sclerophyll Forest on Coastal Floodplains* endangered ecological community near Wangi Creek) are properly managed, including procedures for:
        - weed management (both control and suppression);
        - protection and enhancement of native vegetation and habitat;
        - feral animal control;
        - fire management (including asset protection zones); and
        - management of public access.

HERITAGE

Heritage Management Plan

29. The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Secretary. This Plan must:
    (a) be prepared in consultation with OEH and any relevant Aboriginal stakeholders;
    (b) be submitted for approval to the Secretary within 7 months of the date of this approval;
    (c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;
    (d) detail the responsibilities of all stakeholders; and
    (e) include programs/procedures and management measures for:
        - protection of the section of remnant railway line associated with the decommissioned Wangi Power Station that is located within the site;
        - dealing with previously unidentified Aboriginal objects (excluding human remains), including any need to halt works in the vicinity, assessment of significance, determination of appropriate mitigation measures (by a qualified archaeologist in consultation with Aboriginal stakeholders), re-commencement of works, notifying OEH, and registering the new site(s) in the OEH AHIMS register;
        - dealing with any human remains which may be discovered, including halting of works in the vicinity; notifying NSW Police, OEH, the Department and Aboriginal stakeholders; and not re-commencing any works in the vicinity unless authorised;
        - heritage induction for construction personnel (including procedures for keeping records of inductions);
        - ongoing Aboriginal consultation and involvement (including procedures for keeping records of this);
        - appropriate identification, management, conservation and protection of both Aboriginal and non-Aboriginal heritage items identified on the site; and
        - dealing with previously unidentified non-Aboriginal heritage items which may be discovered during the project.

VISUAL

Visual Amenity and Lighting

30. The Proponent shall:
    (a) minimise visual impacts, and particularly the off-site lighting impacts, of the Myuna Colliery surface facilities site;
    (b) take all reasonable and feasible measures to mitigate off-site lighting impacts from the project; and
    (c) ensure that all external lighting associated on site complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting,*

    to the satisfaction of the Secretary.

WASTE

31. The Proponent shall:
    (a) minimise the waste generated by the project; and
    (a) ensure that the waste generated by the project is appropriately stored, handled and disposed of,

    to the satisfaction of the Secretary.

BUSHFIRE MANAGEMENT

32. The Proponent shall:
    (a) review its existing bushfire management procedures and fire fighting equipment to ensure that the project is suitably equipped to respond to any fires on site; and
    (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.

REHABILITATION

Rehabilitation Objectives

33. The Proponent shall rehabilitate the surface facilities sites to the satisfaction of the Executive Director Mineral Resources. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA, and comply with the objectives in Table 7.

Table 7: Rehabilitation Objectives

Feature	***Objective***
Surface facilities sites.	Safe, stable & non-polluting. Final land use compatible with surrounding land uses.
Project surface infrastructure.	To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise.
Portals and vent shafts	To be decommissioned and made safe and stable. Retain habitat for threatened species (eg bats), where practicable
Community.	Ensure public safety. Minimise the adverse socio-economic effects associated with mine closure.

Notes:

- *These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by mining taking place after the date of this approval; and to all project surface infrastructure part of the project, whether constructed prior to or following the date of this approval.*
- *Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of this approval may be subject to the requirements of other approvals (eg under a mining lease or an Subsidence Management Plan approval) or the Proponent's commitments.*

Progressive Rehabilitation

34. The Proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.

Rehabilitation Management Plan

35. The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of the Executive Director Mineral Resources. This plan must:
    (a) be prepared in consultation with the Department, Fisheries NSW, LMCC, WSC and the CCC;
    (b) be prepared in accordance with any relevant DRE guideline;
    (c) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance;
    (d) build, to the maximum extent practicable, on the other management plans required under this approval; and
    (e) be submitted to the Executive Director Mineral Resources for approval within 12 months of the date of this approval.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results showing:
   (a) an exceedance of any relevant criteria in schedule 3, the Proponent shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the project is again complying with the relevant criteria; and
   (b) an exceedance of any relevant air quality criteria in schedule 3, the Proponent shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the project to be exceeding the relevant 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, then within 2 months of the Secretary's decision the Proponent shall:
   (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
      - consult with the landowner to determine his/her concerns;
      - conduct monitoring to determine whether the project is complying with the relevant criteria in Schedule 3; and
      - if the project is not complying with these criteria, then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
   (b) give the Secretary and landowner a copy of the independent review.

3. If the independent review determines that the project is complying with the relevant 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 shall:
   (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until the project complies with the relevant criteria; or
   (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria,
   to the satisfaction of the Secretary.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must:
   (a) be submitted for approval to the Secretary within 7 months of the date of this approval;
   (b) provide the strategic framework for the 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;
      - respond to emergencies; and
   (f) include:
      - copies of any strategies, plans and programs approved under the conditions of this approval; and
      - a clear plan depicting all the monitoring required to be carried out under the conditions of this approval.

Management Plan Requirements

2. The Proponent shall 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 and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
   (f) a program to investigate and implement ways to 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.

   Note: The Secretary may waive some of these requirements if they are unnecessary for particular management plans.

Adaptive Management

3. The Proponent must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

   Where any exceedance of these criteria and/or performance measures has occurred, the Proponent must, at the earliest opportunity:
   (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;

(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
(c) implement remediation measures as directed by the Secretary,
to the satisfaction of the Secretary.

Annual Review

4. By the end of March 2013, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Secretary. This review must:
   (a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the project over the past calendar year, which includes a comparison of these results against the:
      - the relevant statutory requirements, limits or performance measures/criteria;
      - requirements of any plan or program required under this approval;
      - the monitoring results of previous years; and
      - the relevant predictions in the EA;
   (c) identify any non-compliance over the past 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 measures will be implemented over the next year to improve the environmental performance of the project.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under condition 4 above;
   (b) the submission of an incident report under condition 7 below;
   (c) the submission of an audit under condition 9 below; and
   (d) any modification to the conditions of this approval (unless the conditions require otherwise),
   the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review, the revised document must be submitted to the Secretary for approval."

   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

6. The Proponent shall establish and operate a Community Consultative Committee (CCC) for the project in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version), to the satisfaction of the Secretary. This CCC must be operating within 7 months of the date of this approval.

   Notes:
   - *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval; and*
   - *The Committee should be comprised of an independent chair and appropriate representation from the Proponent, LMCC, WSC, recognised environmental groups and the local community.*

REPORTING

Incident Reporting

7. The Proponent shall notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incidents associated with the project, the Proponent shall notify the Secretary and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

INDEPENDENT ENVIRONMENTAL AUDIT

9. By the end of June 2013, and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the project and assess whether it is complying with the requirements in this approval 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 the abovementioned approvals; and
   (e) recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under the abovementioned approvals.

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

10. Within 6 weeks of the completion of this audit, or as otherwise agreed by the Secretary, the Proponent shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

11. Within 4 months of the date of this approval, the Proponent shall:
   (a) make copies of the following publicly available on its website:
      - the documents referred to in condition 2 of Schedule 2;
      - all relevant statutory approvals for the project;
      - all approved strategies, plans and programs required under the conditions of this approval;
      - a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any approved plans or programs required under the conditions of this or any other approval;
      - a complaints register, which is to be updated on a monthly basis;
      - minutes of CCC meetings;
      - the annual reviews required under this approval;
      - any independent environmental audit of the project, and the Proponent's response to the recommendations in any audit;
      - any other matter required by the Secretary; and

   (b) keep this information up-to-date,

   to the satisfaction of the Secretary.

APPENDIX 1
SCHEDULE OF LAND

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
100		11539
108		11539
37		11539
46		11287
161		11539
45		11287
66		11539
155		11539
124		11539
200		600959
160		11539
27		11287
1		11539
44		548118
2		11539
152		11539
106		11539
4		548107
38		11539
UCL		749999
163		11539
11		11287
44		11287
16		11287
39		11287
151		11539
101		11539
39		11539
31		11287
123		11539
8		11287
162		11539

Lot	Section	DP
34		11539
40		11287
126		11539
		37670
156		11539
74		11539
122		11539
157		11539
102		11539
105		11539
153		11539
35		11287
41		11287
47		11287
7		11287
6		11287
23		11287
71		11539
32		11287
158		11539
29		11287
2		548107
164		11539
1		548107
5		11539
73		11539
154		11539
159		11539
68		11539
25		11287
3530		555858
26		11287

Lot	Section	DP
34		11287
31		548114
69		11539
5		11287
121		11539
165		11539
40		11539
150		11539
18		11287
36		11287
6		11539
149		11539
33		11287
365		46746
4		11539
30		11287
127		11539
37		11287
17		11287
29		548114
104		11539
125		11539
103		11539
43		11287
67		11539
128		11539
19		11287
72		11539
15		11287
107		11539
146		11539
30		548114

Lot	Section	DP
38		11287
70		11539
28		11287
24		11287
35		11539
42		11287
9		11287
3		11539
10		11287
3		548107
148		11539
147		11539
120		11539
471		1138964
466		1138964
227		1137548
400		1150056
402		1150056
401		1150056
14		26634
7		26634
17		26634
9		26634
3		548546
3		26634
20		26634
12		26634
18		26634
330		710063
11		26634
8		26634
13		26634

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
6		26634
15		26634
274		755207
1		26634
402		48820
2		26634
16		26634
19		26634
10		26634
5		26634
4		26634
7001		1077055
47		755207
11		1050120
2		548546
2		810981
23		26634
2		614183
7005		1066246
52		792987
690		12507
A		336081
1		533069
248		12507
360		11287
749		12507
33		582056
534		12507
631		12507
681		12507
191		11287
437		12507

Lot	Section	DP
356		11287
70		12507
2292		554538
378		11287
325		11287
750		12507
38		582057
167		11287
354		11287
667		12507
19		582051
1461		856874
158		11287
280		11287
359		11287
364		11287
211		11287
190		11287
352		11287
2		597631
17		582050
162		11287
697		12507
197		11287
757		12507
203		11287
144		11287
41		539413
394		11287
24		582052
188		11287
541		12507

Lot	Section	DP
59		11287
60		11287
184		11287
410		11287
71		568495
100		863278
678		12507
124		11287
689		12507
532		12507
664		12507
120		11287
320		11287
1		746870
69		12507
196		11287
215		11287
182		11287
557		12507
679		12507
81		11287
42		582058
3		533069
104		11287
685		12507
5		1063845
345		11287
700		12507
530		12507
13		582049
275		11287
633		12507

Lot	Section	DP
305		11287
598		12507
267		11287
760		12507
391		729419
703		12507
219		1137548
217		1137548
218		1137548
103		1088711
472		1138964
2		585142
318		11287
542		12507
322		11287
194		11287
83		11287
91		11287
588		12507
531		12507
3531		555858
16		582050
611		816224
151		11287
118		11287
279		11287
265		11287
13		11287
85		11287
327		11287
54		11287
686		12507

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
355		11287
628		12507
2		746870
119		11287
543		12507
755		12507
35		582056
2		583186
321		11287
95		11287
365		11287
219		11287
751		12507
51		11287
37		582057
40		582057
3672		874598
308		11287
235		11287
372		11287
46		859972
620		12507
1		500470
309		658235
677		12507
112		629441
166		11287
142		11287
371		11287
694		12507
2167		580455
112		11287

Lot	Section	DP
2372		1042396
409		11287
154		11287
374		11287
349		11287
131		11287
41		582058
227		11287
10		808724
168		11287
103		11287
603		12507
687		12507
303		11287
71		12507
7022		584905
36		582056
94		11287
87		11287
14		11287
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2371		1042396
606		12507
49		11287
1		1039389
232		11287
621		12507
540		12507
698		12507
605		12507
1		704490
276		11287

Lot	Section	DP
412		11287
42		539413
613		816224
186		11287
2		533069
50		11287
58		11287
278		11287
172		11287
180		11287
12		11287
2165		580455
536		12507
43		539413
56		11287
213		11287
181		11287
2		567633
523		12507
1		567633
6271		792607
1		727939
526		12507
307		11287
277		11287
596		12507
214		11287
4		1063845
673		12507
619		12507
165		11287
662		12507

Lot	Section	DP
1		807936
44		582058
32		1083788
1		566927
31		1083788
2		1094699
374		727253
376		727253
101		863278
106		1088711
108		1088711
109		1088711
110		1088711
105		1088711
119		1088711
118		1088711
122		1088711
123		1088711
376		11287
377		11287
380		11287
379		11287
221		1137548
222		1137548
220		1137548
114		1088711
121		1088711
226		1137548
223		1137548
225		1137548
216		1137548
3		1079794

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
1271		1010499
9		582048
597		12507
1392		580454
98		11287
758		12507
48		11287
18		582050
115		11287
122		11287
189		11287
156		11287
586		12507
57		11287
224		11287
12		621361
2012		1052556
73		568495
612		816224
11		1022724
1391		580454
315		11287
125		11287
96		11287
323		11287
414		11287
753		12507
674		12507
358		11287
665		12507
1003		650194
177		11287

Lot	Section	DP
537		12507
129		11287
153		11287
126		11287
25		582053
29		582054
11		808724
373		11287
130		11287
10		582048
148		11287
B		336081
600		12507
6222		819628
174		11287
135		11287
193		11287
53		11287
31		582055
76		12507
602		12507
521		1054794
27		582054
202		11287
350		11287
661		12507
634		12507
140		656807
134		11287
208		11287
370		11287
187		11287

Lot	Section	DP
326		11287
746		12507
274		11287
519		12507
699		12507
604		12507
141		11287
32		582055
684		12507
683		12507
209		11287
306		11287
752		12507
234		11287
195		11287
672		12507
522		1054794
2		568493
7021		584905
157		11287
231		11287
6232		806876
198		11287
2161		580453
233		11287
682		12507
117		11287
587		12507
128		11287
630		12507
173		11287
388		727264

Lot	Section	DP
266		11287
84		11287
2381		574218
675		12507
357		11287
264		11287
160		11287
137		11287
10		1022724
176		11287
533		12507
2163		580453
624		12507
629		12507
375		11287
756		12507
2164		580453
538		12507
6273		792607
257		12507
200		11287
207		11287
12		1022724
105		11287
2		807936
411		11287
55		11287
132		11287
3671		874598
79		11287
366		11287
1		583186

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
607		12507
97		11287
2162		580453
192		11287
688		12507
80		11287
206		11287
47		859972
89		11287
147		11287
205		11287
199		11287
748		12507
86		11287
250		12507
747		12507
361		11287
185		11287
525		12507
695		12507
692		12507
7		582047
2166		580455
75		12507
26		582053
228		12507
102		11287
161		11287
529		12507
6		582047
111		629441
230		11287

Lot	Section	DP
204		11287
539		12507
6231		806876
28		582054
353		11287
223		11287
164		11287
701		12507
618		12507
691		12507
668		12507
2		500470
680		12507
222		11287
14		582049
6221		819628
123		11287
731		836821
314		11287
324		11287
316		11287
39		582057
693		12507
346		11287
6272		792607
220		11287
143		11287
212		11287
2291		554538
30		582055
1		651963
226		11287

Lot	Section	DP
544		12507
178		11287
363		11287
155		11287
11		582048
20		582051
221		11287
585		12507
236		11287
15		582049
12		582049
1272		1010499
175		11287
210		11287
319		11287
218		11287
249		12507
121		11287
138		11287
268		11287
2011		1052556
663		12507
528		12507
5		582046
133		11287
109		11287
163		11287
43		582058
225		11287
599		12507
239		11287
88		11287

Lot	Section	DP
149		11287
517		12507
2382		574218
72		568495
68		12507
8		582048
23		582052
108		11287
413		11287
632		12507
106		11287
304		11287
518		12507
150		11287
696		12507
317		11287
754		12507
116		11287
1		1094699
347		11287
313		11287
351		11287
343		11287
344		11287
101		1088711
100		1088711
112		1088711
115		1088711
116		1088711
53		755207
113		1088711
302		11287

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Lot	Section	DP
104		1088711
107		1088711
102		1088711
111		1088711
120		1088711
117		1088711
224		1137548
228		1137548
601		12507
527		12507
520		12507
730		836821
1		704468
545		12507
669		12507
51		792987
21		582052
93		11287
34		582056
10		1055349
52		11287
145		11287
183		11287
348		11287
522		12507
2		704490
247		12507
430		12507
136		11287
90		11287
671		12507
524		12507

Lot	Section	DP
22		582052
521		12507
666		12507
179		11287
217		11287
670		12507
342		11287
101		880089
386		727264
589		12507
592		12507
593		12507
729		12507
582		12507
591		12507
6161		870274
6081		806879
584		12507
594		12507
617		12507
613		12507
615		12507
730		12507
609		12507
614		12507
590		12507
595		12507
611		12507
583		12507
6162		870274
612		12507
610		12507

Lot	Section	DP
132		8055
222		8055
105		15556
62		27749
40		15556
203		1020262
116		15556
53		13120
73		15556
192		1046133
50		15556
631		872639
100		8055
22		1029069
2		542486
11		15556
912		747550
32		524726
75		13123
27		15556
102		558722
13		13123
86		13123
52		27749
28		27749
97		8055
201		8055
821		588493
200		843074
159		8055
107		15556
64		15556

Lot	Section	DP
74		13123
70		13123
191		880592
112		13123
33		15556
95		8055
126		13123
6		13120
42		13123
7		13123
153		13123
67		27749
82		13123
24		27749
120		13123
114		8055
58		15556
122		15556
54		15556
23		15556
352		840188
93		13123
111		15556
121		15556
25		15556
49		13123
126		8055
120		15556
7		15556
204		8055
131		13123
152		13123

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Lot	Section	DP
1		568311
24		13123
235		8055
112		15556
26		13120
76		15556
34		12472
29		13123
220		8055
1		579042
51		13120
96		13123
146		13123
64		13123
42		27749
123		13123
72		15556
522		543408
202		8055
104		8055
80		13123
40		27749
38		13120
21		15556
199		8055
65		15556
49		13120
69		15556
155		17367
57		13120
225		8055
125		8055

Lot	Section	DP
2		579042
23		13120
41		13120
26		15556
192		880592
73		13123
106		13123
60		1074161
42		1073017
872		733417
2		270423
5		270423
1		1088536
259		8055
118		15556
5		981103
4		981106
2062		1011261
60		15556
8		524374
90		8055
862		557889
37		15556
92		8055
82		740968
114		13123
68		15556
17		13120
228		8055
89		13123
1		542486
221		8055

Lot	Section	DP
6082		806879
100		880089
10		1071069
3991		1136246
110		607364
1		880078
38		12472
9		263812
42		12472
40		12472
2		801982
48		12472
43		12472
22		791703
4		727713
1		616354
1		10585
1		270043
179		8055
250		8055
3		803077
170		8055
2		1013763
4		568311
240		8055
178		8055
2		568311
181		8055
185		8055
180		8055
183		8055
186		8055

Lot	Section	DP
18		15556
55		27749
4		15556
59		15556
236		8055
10		15556
28		13123
72		13123
19		15556
117		13123
18		527120
156		17367
94		8055
128		8055
105		13123
136		8055
122		13123
110		8055
103		8055
2		806513
87		8055
1		250973
52		13120
152		17367
39		15556
21		13120
5		519261
109		13123
86		15556
47		27749
6		519261
91		8055

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Lot	Section	DP
207		8055
249		8055
2		621171
1		621171
247		8055
166		8055
177		8055
721		537942
189		8055
D		25385
251		8055
190		8055
E		25385
1		803077
2		204202
773		619779
184		8055
252		8055
771		619779
1		1058010
20		1075811
21		1075811
751		1099436
753		1099436
174		8055
248		8055
169		8055
91		880881
C		25385
2		1058010
191		8055
B		25385

Lot	Section	DP
245		8055
49		27749
201		843074
66		13123
145		13123
115		8055
38		15556
204		1017819
89		8055
205		1017819
27		13120
78		13123
254		8055
30		13123
55		13120
100		713777
68		13123
106		8055
4		13120
35		27749
142		13123
1		561577
39		13120
133		8055
81		8055
34		27749
25		13123
35		13123
3		588206
12		13120
833		598304
154		8055

Lot	Section	DP
92		13123
244		8055
175		8055
168		8055
78		8055
173		8055
1		204202
176		8055
171		8055
1		1074358
2		1074358
76		8055
243		8055
241		8055
210		8055
193		8055
172		8055
135		8055
56		15556
30		15556
66		27749
129		13123
1		505798
63		27749
9		15556
18		28068
14		15556
17		28068
31		15556
2		803077
781		1060935
54		27749

Lot	Section	DP
123		8055
58		27749
105		8055
119		13123
167		8055
218		8055
154		13123
57		15556
209		8055
28		13120
36		15556
36		13123
55		15556
617		821603
26		13123
47		13123
98		13123
2		13120
104		13123
31		13123
125		13123
2061		1011261
65		13123
35		12472
38		13123
20		13120
121		8055
147		8055
450		818534
115		15556
6		15556
22		13123

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Lot	Section	DP
10		13123
3		568311
155		13123
74		15556
822		588493
50		27749
117		8055
61		15556
233		8055
110		15556
97		13123
8		13123
56		13120
47		13120
58		13120
246		8055
3		621171
43		27749
113		13123
41		13123
147		13123
772		619779
118		13123
102		8055
46		13123
2		15556
46		27749
196		8055
8		931022
48		15556
27		27749
79		13123

Lot	Section	DP
521		543408
121		13123
15		538780
168		13123
65		27749
98		8055
50		13120
27		13123
99		8055
10		28068
226		8055
143		13123
46		15556
14		28068
127		13123
127		8055
120		8055
33		13123
138		8055
100		15556
103		13123
18		13120
111		13123
200		8055
48		27749
22		27749
194		8055
54		13120
192		8055
9		13120
37		13123
197		8055

Lot	Section	DP
71		15556
20		13123
100		790729
8		13120
782		1060935
15		28068
812		816616
32		15556
37		13120
1		13120
242		8055
155		8055
134		8055
63		13123
14		538780
51		15556
232		8055
205		8055
4		28068
1		551113
5		250973
31		13120
5		1074358
3		1074358
46		13120
4		1074358
61		1074161
63		1074161
62		1074161
103		15556
41		1073017
722		537942

Lot	Section	DP
871		733417
47		15556
39		27749
14		13123
211		8055
112		8055
142		8055
227		8055
3		28068
28		15556
109		15556
142		15556
15		13123
153		17367
223		8055
77		15556
215		8055
158		8055
151		13123
2		375836
15		13120
31		27749
110		13123
43		15556
3		579042
831		598304
59		27749
48		13120
13		13120
224		8055
1		794206
44		13120

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Lot	Section	DP
53		15556
101		790729
16		13123
107		8055
53		27749
109		8055
32		13123
34		13123
84		13123
29		13120
19		13120
117		15556
164		8055
43		1073017
154		17367
88		15556
6		270423
4		270423
51		27749
202		1020262
1692		1110053
3		981104
2144		1124129
11		13123
7311		1141467
51		12472
501		630971
49		12472
45		12472
41		12472
46		12472
52		12472

Lot	Section	DP
47		12472
1		12863
92		800646
158		17367
45		11995
26	F	27655
6		1018646
7	C	27655
2		22842
39	C	27655
5		22842
163		17367
71		618457
101		1014736
29	C	27655
21		248691
12		23604
99		11995
414		755242
118		17367
23	E	27655
3		1018646
30	D	2458
13		716529
53		785435
24	F	27655
64		11995
8	E	2458
27		11995
423		755242
D		356160
5		23604

Lot	Section	DP
57		17367
2		512166
21	E	27655
17	E	27655
2		16793
B		380066
91		11995
37	C	27655
15		23604
17		11995
12		22842
8		17367
89		17367
17	F	2458
28	C	27655
162		13123
7		248691
92		17367
118		11995
5		17367
94		17367
68		11995
72		17367
122		17367
10	D	2458
223		833454
87		11995
141		17367
15	E	27655
98		11995
380		755242
164		13123

Lot	Section	DP
10		17367
101		844302
164		17367
63		17367
76		11995
21	F	27655
115		11995
7	A	2458
9		22842
58		17367
20		23604
8		17781
11		248691
1		870118
11	D	2458
223		1004649
415		755242
64		17367
1		1018646
6		17781
90		11995
9	E	2458
135		249719
97		11995
146		17367
2	C	27655
43		17367
850		810843
12		625009
138		17367
139		13123
36		17367

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Lot	Section	DP
9	E	27655
5		285482
19	E	27655
2		1018646
4		16793
23		23604
15		11995
1		22842
14	D	2458
141		15556
25		11995
33	D	2458
76		17367
17		23604
11		23604
120		17367
139		17367
97		17367
10	C	27655
45	C	27655
9		28068
20		22842
14	E	27655
27	D	2458
18	E	2458
67		11995
3		16793
417		755242
11		17367
9	F	27655
83		17367
16		248691

Lot	Section	DP
7	E	2458
80		11995
113		17367
51		17367
5		1018646
7		17781
125		15556
142		17367
6		13123
41		17367
33		23604
65		11995
6		11995
845		810843
22	D	2458
124		15556
54		11995
271		845831
137		17367
25		23604
21		23604
57		11995
16		22842
7	F	27655
168		15556
56	C	27655
117		17367
28		23604
383		755242
8	E	27655
152		854877
33	F	2458

Lot	Section	DP
96		11995
186		15556
98		17367
40		17367
43		11995
12	C	27655
22	E	27655
14		11995
13		23604
C		365476
17		22842
38	C	27655
158		13123
70		17367
121		17367
222		833454
23	D	2458
844		810843
13	E	2458
18	F	2458
11		11995
3		627231
34	F	2458
13	E	27655
101		11995
151		17367
18	E	27655
4	E	27655
73		11995
8		22842
23	C	27655
11	F	27655

Lot	Section	DP
10		11995
2		861549
413		755242
22	C	27655
105		17367
16	D	2458
24		23604
10		16793
9		17781
12	D	2458
12	E	27655
101		17367
89		11995
48		17367
13		22842
119		17367
127		15556
2		251160
6	E	27655
39	D	2458
23	F	27655
1		23604
2		814599
81		17367
99		15556
1		861549
40	D	2458
63		11995
109		17367
12	F	27655
79		11995
44	D	2458

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Lot	Section	DP
B		365476
124		17367
848		810843
54	C	27655
392		755242
143		1105594
141		1105594
111		1116254
103		1119224
721		737050
105		1119224
101		1119224
387		755242
386		755242
402		1131722
43	C	27655
7322		1141840
18	D	2458
179		15556
59		11995
5		11995
37	D	2458
81		620426
41	D	2458
39		11995
142		852383
112		17367
83		620426
6		17367
23		1016699
149		17367
33	C	27655

Lot	Section	DP
147		17367
24	D	2458
31	C	27655
5	C	27655
9		248691
109		11995
131		859693
44		17367
8	F	27655
2		28068
126		15556
4		13123
100		11995
2		285482
18		248691
19		23604
133		15556
46		654032
48	C	27655
176		15556
13		625009
133		249719
10		23604
342		556246
49		17367
4		17781
91		800646
12	E	2458
842		810843
123		17367
36	D	2458
10	E	27655

Lot	Section	DP
1		632417
53	C	27655
140		13123
3		251160
79		15556
21	C	27655
68		17367
125		17367
32	F	2458
20		11995
3		861549
16	F	2458
2	E	27655
45		654334
38		17367
103		11995
51	C	27655
21		11995
83		11995
24	C	27655
4		778463
22		23604
37		11995
132		15556
13	D	2458
159		13123
3		285482
32		23604
143		17367
129		15556
12		11995
15	C	27655

Lot	Section	DP
141		852383
32	D	2458
160		13123
75		17367
29		23604
3	E	27655
3		17781
16		11995
6	C	27655
36		11995
22		1016699
31	E	27655
103		1014736
1	F	27655
88		11995
9	C	27655
8	D	2458
28	D	2458
9		16793
161		13123
2		17781
1		727245
5		13123
224		1004649
35		11995
52		785435
131		15556
11		625009
49		11995
3811		1049904
1	C	27655
14		17367

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Lot	Section	DP
4		262960
16		573091
93		11995
20		248691
56		17367
166		17367
3		23604
102		11995
222		1066814
36	F	2458
159		17367
17	C	27655
117		11995
66		11995
78		17367
2		23604
17	D	2458
80		17367
115		17367
98		15556
29	D	2458
2	F	27655
7		11995
104		17367
48		11995
114		11995
9		11995
55		11995
24	E	27655
42		17367
1		814599
79		17367

Lot	Section	DP
B		367461
110		17367
44		11995
173		15556
35	C	27655
77		11995
140		17367
42	D	2458
40	C	27655
841		810843
74		11995
A		367461
14	C	27655
17		248691
4		11995
112		11995
60		17367
86		11995
11		803842
35		17367
391		755242
25	C	27655
22		248691
1		608817
39		17367
11		22842
33		11995
7074		1029683
111		17367
18	C	27655
108		17367
20	D	2458

Lot	Section	DP
420		755242
3		262960
843		810843
8		11995
165		17367
129		17367
12		248691
100		17367
2		632417
136		17367
3		22842
4		251160
34	D	2458
187		15556
60		11995
86		17367
418		755242
14		22842
12		1050193
20	E	27655
6		22842
		45057
20	F	2458
52		11995
343		556246
133		17367
103		17367
13		248691
A		380066
13		17367
106		11995
35	D	2458

Lot	Section	DP
114		17367
150		17367
27	C	27655
846		810843
5		248691
43	D	2458
71		17367
30		11995
3812		1049904
34		11995
99		17367
23	F	2458
132		17367
121		836139
5		262960
49	C	27655
163		13123
2	H	2458
19		248691
138		13123
26		23604
7		17367
137		15556
15	E	2458
145A		17367
102		1014736
108		11995
1		436113
16	C	27655
5		16793
84		17367
38		11995

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
53		17367
52	C	27655
31	F	2458
851		810843
3		11995
35	F	2458
25	E	27655
62		11995
221		1066814
119		11995
9		17367
166		13123
15		248691
4	G	2458
62		17367
44	C	27655
1572		1043970
424		755242
71		11995
113		1116254
102		1119224
104		1119224
388		755242
390		755242
389		755242
395		755242
7323		1141840
72		11995
14		23604
18		11995
2		870118
8	C	27655

Lot	Section	DP
6		285482
91		17367
28		11995
6		16793
1		251160
52		17367
145		17367
500		755242
12		16793
134		249719
416		755242
138		15556
1		602008
27		23604
12		17367
10		22842
6		251160
21	D	2458
34		23604
122		11995
132		859693
130		17367
1		16793
A		365476
36	C	27655
25	D	2458
59		17367
849		810843
45	D	2458
25		17367
20	C	27655
110		11995

Lot	Section	DP
82		620426
56		11995
10	E	2458
3		13123
67		17367
81		11995
136		249719
185		15556
30	E	27655
5		17781
7	E	27655
4		248691
102		17367
15		22842
75		11995
13		11995
69		17367
42		11995
40		11995
134		15556
55		17367
134		17367
3	H	2458
5	E	27655
31	D	2458
19	F	2458
439		755242
137		249719
51		785435
21	F	2458
30	F	2458
9	D	2458

Lot	Section	DP
10		17781
10		248691
1		262960
32	E	27655
2		634668
124		11995
140		15556
26	E	27655
3		814599
419		755242
144		17367
5		251160
8		248691
2		17367
65		17367
47		11995
847		810843
19		22842
105		11995
85		17367
130		15556
37		17367
93		17367
28	E	27655
96		17367
21		17367
127		17367
94		11995
7		16793
132		249719
14		248691
29	F	2458

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
58		11995
1		285482
1		17781
17		573091
7	D	2458
102		844302
12		716529
26	D	2458
61		17367
54		785435
95		11995
120		11995
113		11995
7		22842
23		248691
90		17367
95		17367
73		17367
11	C	27655
2		13123
32	C	27655
16	E	2458
27	F	27655
24		17367
1		13123
123		15556
55	C	27655
92		11995
22	F	2458
421		755242
135		17367
165		13123

Lot	Section	DP
128		17367
125		11995
4		23604
106		17367
3	C	27655
16	E	27655
55		785435
341		556246
160		17367
393		755242
4	C	27655
6		248691
29		11995
3810		1049904
148		17367
206		15556
136		15556
116		11995
87		17367
18		23604
131		249719
151		854877
29	E	27655
202		700345
272		845831
16		23604
722		737050
162		17367
46	C	27655
53		11995
26	C	27655
31		23604

Lot	Section	DP
131		17367
15	D	2458
88		17367
17	E	2458
82		17367
30		23604
116		17367
2		262960
4		17367
32		11995
50	C	27655
107		11995
38	D	2458
4		1018646
11		16793
31		11995
5		778463
107		17367
104		11995
41		11995
50		11995
123		11995
13	C	27655
82		11995
85		11995
61		11995
54		17367
19		11995
128		15556
30	C	27655
26		11995
84		11995

Lot	Section	DP
10	F	27655
19	C	27655
126		17367
11	E	27655
14	E	2458
135		15556
78		11995
66		17367
18		22842
11	E	2458
7		285482
5	E	2458
121		11995
8		16793
74		17367
77		17367
46		11995
161		17367
22	F	27655
201		700345
50		17367
51		11995
19	D	2458
139		15556
6	E	2458
142		1105594
45		1109834
69		11995
112		1116254
4	H	2458
1		622484
106		1119224

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
7015		1119454
470		1118245
397		755242
385		755242
394		755242
398		755242
396		755242
401		1131722
105		238489
5	F	27655
44		862349
4	F	27655
1	H	2458
103		238489
6	F	27655
104		238489
102		238489
316		755242
3		26549
7016		1021267
1		25985
15	J	27655
3	F	27655
12	J	27655
1		778463
1	J	2458
18	J	27655
103		730402
102		730402
11	J	27655
14	J	27655
6		25985

Lot	Section	DP
3		778463
17	J	27655
16	J	27655
6		26549
10	J	27655
		70772
1		26549
13	J	27655
2		25985
3		25985
21	J	27655
101		730402
2		778463
4		25985
5		25985
122		807535
7306		1146817
4		28046
2		629396
11		28046
6		18060
A		340249
3		629396
3		18060
2		204737
3		28046
2		18060
3		204737
1		18060
7		18060
7033		1021485
1		317336

Lot	Section	DP
3		315830
B		395654
B		340249
11		701829
1		204737
13		701829
8		28046
2		311027
C		327578
40		1102122
132		6945
9		28046
1341		844700
41		559640
B		391075
2		28046
5		18060
5		28046
133		6945
1		629396
B		327578
1		28046
151		6945
150		6945
10		28046
6		28046
12		701829
A		391075
7		28046
4		18060
1342		844700
1		1092888

Lot	Section	DP
1		270423
3		270423
201		1093288
202		1093288
752		1099436
1		1107356
2		1107356
1691		1110053
1693		1110053
12		13123
21		13123
50		13123
7309		1141468
195		8055
88		13123
1		551787
198		8055
148		13123
256		8055
95		13123
26		27749
69		27749
33		13120
76		13123
15		15556
3		15556
22		13120
75		15556
94		13123
100		13123
130		8055
14		13120

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
1482		562711
632		872639
43		13123
45		13123
113		15556
30		13120
115		13123
18		13123
83		13123
255		8055
4		250973
52		15556
34		13120
114		15556
24		13120
87		13123
37		27749
71		13123
61		27749
157		13123
108		13123
106		15556
208		8055
44		15556
3		250973
230		8055
124		13123
23		13123
802		1038413
51		13123
113		8055
11		13120

Lot	Section	DP
54		13123
66		15556
70		27749
231		8055
149		13123
16		13120
19		13123
29		27749
48		13123
238		8055
68		27749
3		375836
39		13123
801		1038413
49		15556
93		8055
45		13120
32		13120
2		561577
5		15556
85		13123
1		15556
67		15556
101		15556
101		8055
167		13123
24		15556
234		8055
212		8055
873		733417
33		524726
832		598304

Lot	Section	DP
30		27749
151		734618
22		15556
137		8055
17		13123
44		27749
69		13123
13		15556
219		8055
60		13120
144		13123
260		8055
253		8055
165		8055
911		747550
128		13123
57		27749
91		13123
131		8055
124		8055
45		15556
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40		13123
99		13123
25		27749
42		872109
34		15556
38		27749
88		8055
140		8055
157		8055
107		13123

Lot	Section	DP
13		28068
44		13123
139		8055
56		27749
36		13120
351		840188
216		8055
17		15556
60		27749
1		806513
35		13120
41		27749
7		13120
43		13120
116		13123
29		15556
5		13120
70		15556
108		8055
36		27749
217		8055
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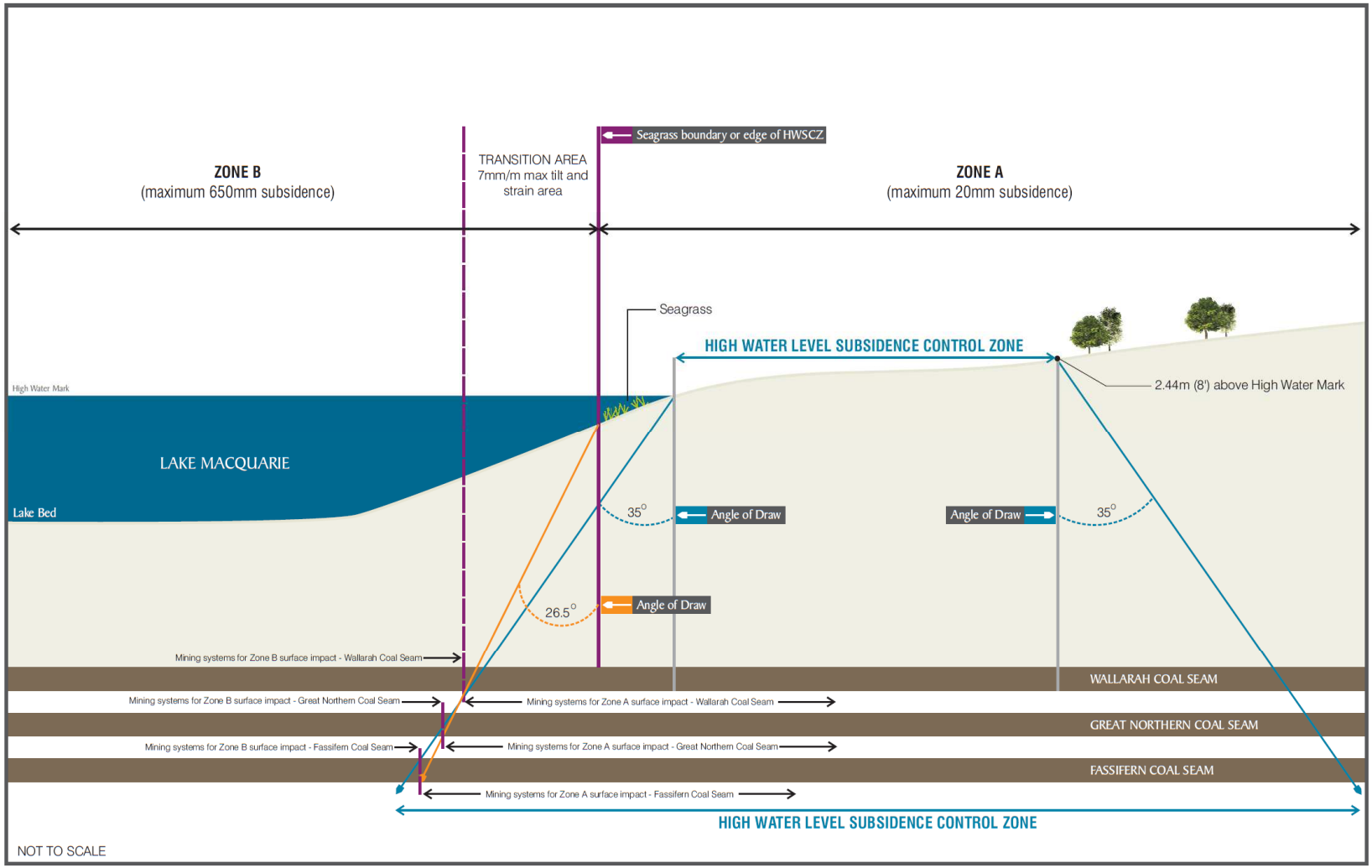
9		13123
77		13123
229		8055
129		8055
20		15556
42		13120
3		561577
2		551787
16		15556
21		1029069

Myuna Colliery Extension of Mining Project - Schedule of Land

Lot	Section	DP
8		15556
203		8055
25		13120
156		8055
811		816616
239		8055
102		13123
41		872109
56		13123
62		15556
7		524374
59		13120
67		13123
23		27749
156		13123
3		13120
150		13123
64		27749
191		1046133
90		13123
55		13123
130		13123
111		8055
861		557889
119		8055
21		27749
42		15556
41		15556
141		13123
81		13123
12		15556
122		8055

Lot	Section	DP
40		13120
96		8055
237		8055

APPENDIX 2
HIGH WATER LEVEL SUBSIDENCE CONTROL ZONE



APPENDIX 3
PROJECT LAYOUT PLAN

Figure 1: Project General Arrangement

Figure 2: Surface Facilities Area

APPENDIX 4
SENSITIVE NOISE RECEIVER LOCATIONS

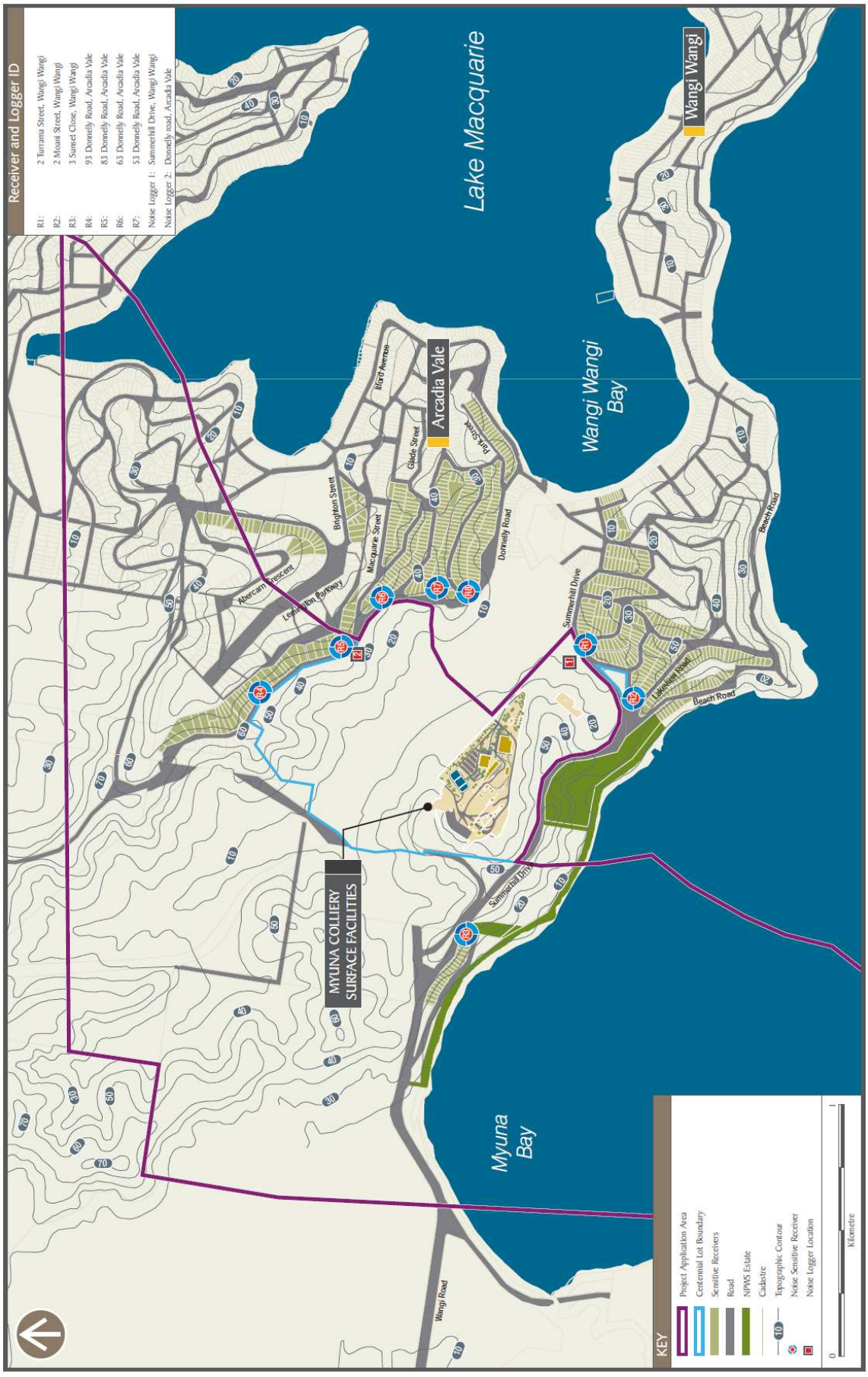


Figure 1: Sensitive Noise Receiver Locations

APPENDIX 5
STATEMENT OF COMMITMENTS

6.1 Statement of Commitments – Construction

Desired Outcome/Commitment	Action
Clean Water Diversion Works	
Construction of the clean water diversions at the Surface Facilities Area undertaken in a manner that will minimise impacts to the surrounding environment.	1. Construction will be undertaken during the hours 7am to 6pm Monday to Friday, and 8am to 1pm on Saturdays. No construction work will be undertaken on Sundays or Public Holidays.

6.2 Statement of Commitments – Operation

Desired Outcome/Commitment	Action
Hours of Operation	
Operations undertaken within the approved operating hours.	2. Mining and associated operations will be undertaken 24 hours a day, 7 days a week.
Subsidence	
Subsidence levels managed within predicted maximum levels.	3. Mining will be undertaken in accordance with the document titled 'Design Criteria and Mining Methods for Seams' provided as Attachment 1 to the Response to Submissions. 4. An Extraction Plan, or equivalent document, which takes into account the existing information presented in this Environmental Assessment, will be developed for mining within subsidence Zone B, in consultation with the DP&I, prior to secondary workings being undertaken in Zone B.
Groundwater and Surface Water	
Operations carried out in a manner that minimises potential impacts to groundwater.	5. Within 6 months of Project Approval, a variation to EPL 366 will be lodged with the Office of Environment and Heritage to: • Combine licensed discharge points LDP001 and LDP002 into a single licensed discharge point, LDP B, with a combined discharge volume of 13 ML/day; • Establish a licensed discharge point at the Emergency Coal Stockpile Sediment Dam, LDP A, for event-based discharges where rainfall exceeds 140 millimetres in 24 hours. 6. The Proponent will undertake an investigation of water reuse options at Myuna Colliery within 6 months of Project Approval.

Aboriginal Heritage	
Items and areas of Aboriginal sensitivity are not disturbed as a result of the proposed Project, where possible.	7. If first workings and/or secondary extraction is to occur under the culturally sensitive sites recorded in Addendum A and Addendum B of the EA, an archaeological monitoring programme is to be developed for the potentially impacted site(s). 8. If there is evidence of Myuna Colliery mining-induced damage to sandstone outcrops and rock overhangs as described in Addendum A and Addendum B of Appendix M to the EA, all mining works affecting qualified archaeologist and the relevant Aboriginal stakeholders will be engaged as required. 9. Myuna Colliery will develop an Aboriginal Cultural Heritage Management Plan (ACHMP) for the identified Aboriginal heritage items within the Project Area, as well as, contingency strategies for any additional heritage issues which may arise. The ACHMP will comprise: • An assessment of the cultural significance of the Aboriginal heritage sites within the Project Area; • Identification of roles and responsibilities (Centennial, Aboriginal stakeholders, heritage consultant); and • Strategies for: ○ Management of identified Aboriginal heritage sites; ○ Management of Aboriginal Heritage sites, should subsidence levels exceed the maximum predicted subsidence of 20 mm; and ○ Management of additional sites, if identified. The Myuna Colliery ACHMP will be developed in consultation with the relevant Aboriginal stakeholders and will adequately address Aboriginal cultural values.
Aquatic Ecology	
Assess potential impacts from subsidence on benthic communities prior to secondary extraction.	10. Prior to undertaking secondary workings in Zone B, Myuna has committed to the development of an Extraction Plan. In relation to the benthic community of the Lake, this plan will include: a) Refining the predicted subsidence based on a detailed mine layout and design; b) An assessment of the likely impacts of subsidence related to the detailed mine layout and design (based on prediction) on benthic communities within the proposed mining area; c) An assessment of the consequences of these impacts on the availability of light to the

	benthic communities, including the proportion of the Lake bed likely to be affected; and d) Management strategies to avoid reducing light availability to the Lake bed where the proportion of the Lake bed likely to be affected is, following consultation with the Office of Environment and Heritage, considered significant.
Life of Mine Rehabilitation	
Sufficient planning is undertaken for end of life of mine and rehabilitation.	11. The proponent will develop and implement a Rehabilitation and Environmental Management Plan within 5 years of completion of mining.

6.3 Statement of Commitments – Mine design criteria and extraction methods within coal seams

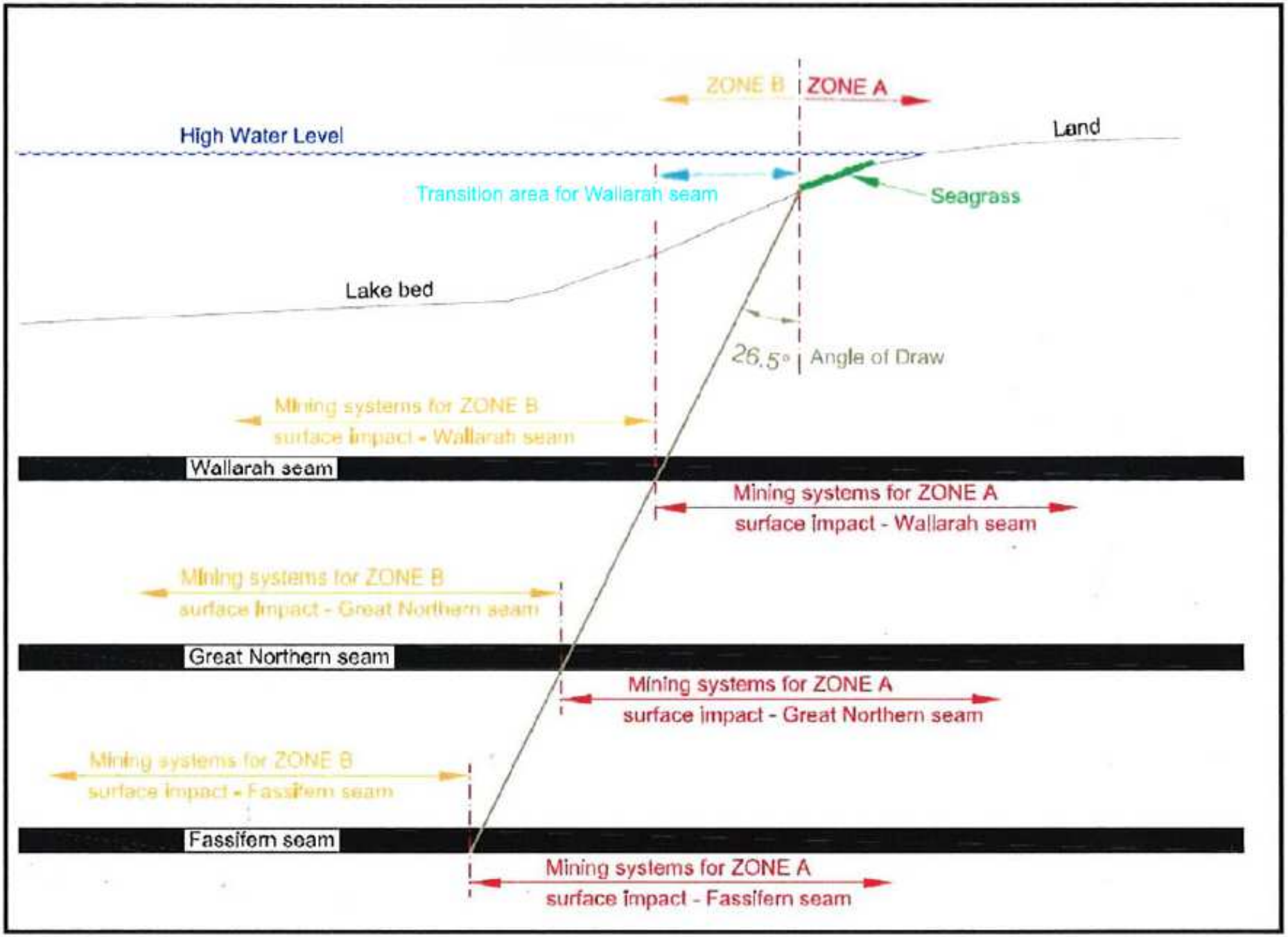
Seam	*Location (at Surface level)*	*Mining System (at seam level)*	*Design Criteria*
Wallarah	*Zone A+Transition area*	*First Workings ONLY*	***(1)*** ***(2)***
	Zone B		
Great Northern	*Zone A+Transition area*	*First Workings ONLY*	***(1)*** ***(2)***
	Zone B	*First Workings and Partial Extraction (typically Non Caving)*	***(1)*** ***(2)*** ***(3)***
Fassifern	*Zone A+Transition area*	*First Workings ONLY*	***(1)*** ***(2)***
	Zone B	*First Workings and Partial Extraction*	***(1)*** ***(2)*** ***(3)***

Table 1.

(1) Legislative Requirements - CMHSR 2006 Clause 32 & Clause 88(2)(a) (1) - **First Workings:** (Clause 88 - Minimum pillar size will be $1/10^{th}$ of depth or 10 metres).

(2) Factor of Safety (FOS) based on UNSW Methodology - Calculations (including depth of cover, maximum roadway width/height and minimum dimensions of coal pillars) to determine the probability of instability consistent with the pillars role or roles over its life. The University of New South Wales (UNSW) developed the FOS calculations utilizing industry gathered data. From investigation an acceptable long term FOS value greater than 2.11 (FOS>2.11) is adopted for long term stable pillars. This provides a probability of failure of 1: 1,000,000.

(3) Geotechnical Consultant Review: Prior to commencement of a Partial Extraction mining system in a new area, Myuna Colliery engages a Coal Mining Geotechnical Consultant to review the proposed design for each particular area. Design criteria involve review of seam floor and roof strength to determine suitability of mine design given multi-seam workings.


ZONE B
ZONE A
High Water Level
Land
Transition area for Wallarah seam
Seagrass
Lake bed
26.5°
Angle of Draw
Mining systems for ZONE B
surface impact - Wallarah seam
Wallarah seam
Mining systems for ZONE A
surface impact - Wallarah seam
Mining systems for ZONE B
surface impact - Great Northern seam
Great Northern seam
Mining systems for ZONE A
surface impact - Great Northern seam
Mining systems for ZONE B
surface impact - Fassifern seam
Fassifern seam
Mining systems for ZONE A
surface impact - Fassifern seam

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APPENDIX 3 Myuna Colliery Weed Action Plan 2016

RESTORING THE BALANCE

Myuna Colliery Weed Action Plan 2016

Centennial Coal

February 2016

This Annual Weed Action Plan has been prepared for the Myuna Colliery site off Summerhill Drive, Wangi Wangi, NSW. It has been produced for Morgan Gleeson in February 2016 to provide an overview of previous control works conducted on the site and current weeds present on the site. This plan also discusses control requirements under the NSW Noxious Weeds Act and proposed control methods and timing for 2016.

SUBMITTED TO	DATE	REVISION
Morgan Gleeson	16/02/2016	Draft
Morgan Gleeson	26/02/2016	Final

This document can only be considered as having permission for final distribution if an original signature of an authorized representative of HLM is found below:

SIGNATURE

26/02/2016

DATE

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Cover Photo: Lantana controlled amongst Sweet Pittosporum

Contents

1. Introduction

Myuna Colliery is located off Summerhill Drive in the suburb of Wangi Wangi, New South Wales, an active underground mining operation which supplies coal to nearby Eraring Power Station directly via conveyor. The disturbance area associated with day to day operations covers less than one quarter of the total landholding, which when combined with previous disturbance impacts of road, access points and superseded infrastructure clearing or regular access has affected approximately one third of the total management area.

Observations of vegetation and landscape integrity indicate that more than one half of the landholding has never been disturbed, or has been disturbed infrequently by mining and associated activities. These areas support functional natural vegetation communities with little to no weed invasion and minimal management requirements. The main management need in these areas is the maintenance of boundary edges to control weeds established there and reduce the likelihood of creeping establishment of weed species in from these edges. The labour and material input required for effective suppression of weeds and integrity of the natural system is minimal, as competition from indigenous species is high.

From 2012 to the end 2015 there have been four Weed Action Plans conducted at Myuna Colliery, including an annual weed survey and on ground works. This has resulted in the ongoing suppression and removal of Lantana, Bitou Bush, Pampas Grass, Pine Trees and Castor Oil among others from those areas identified in **Figure 2**.

During 2015 HLM spent approximately 100 labour hours on ground at the site actively controlling high priority target weeds. This equates to five days with a crew of two carrying out primarily cut and paint bush regeneration methods, supported by foliar spraying for dense lantana and crofton weed infestations. Where suitable (ie away from waterways) selective herbicides such as Starane and 2-4-D were used to spray lantana to limit the off target damage to grasses and other non-susceptible species. This in turn helps to maintain active groundcover. This was primarily used on plants growing up to and through boundary fences in hard to reach locations for time efficient control.

2015 weed control work (outlined in **Figure 2** below) was targeted at Area 4 and 5 (along creek). Weeds targeted were Bitou Bush, Lantana and Cassia. Work moved on to Wangi Creek in Area 4 with Lantana, Bitou Bush and Tree Tobacco were targeted. Other weeds targeted in Area 4 were Castor Oil and Pampas Grass. Area 2 was treated for Cape Broom, Cassia and Blackberry.

Further works will be required in Areas 4 and 5 to eradicate any new weed growth. Wangi Creek in Area 5 should be the focal point for 2016 with maintenance work in all other areas to follow. Area 2 along Summer Hill Driver boundary had a large infestation of Lantana and will require ongoing treatment in 2016 and beyond.

HLM undertook the following methodology to conduct the Weed Action Plan. This included conducting a 4WD/walking survey of the site, geo-referencing weed locations, researching and prioritising weeds identified onsite and outlining proposed timing and control methods for 2016.

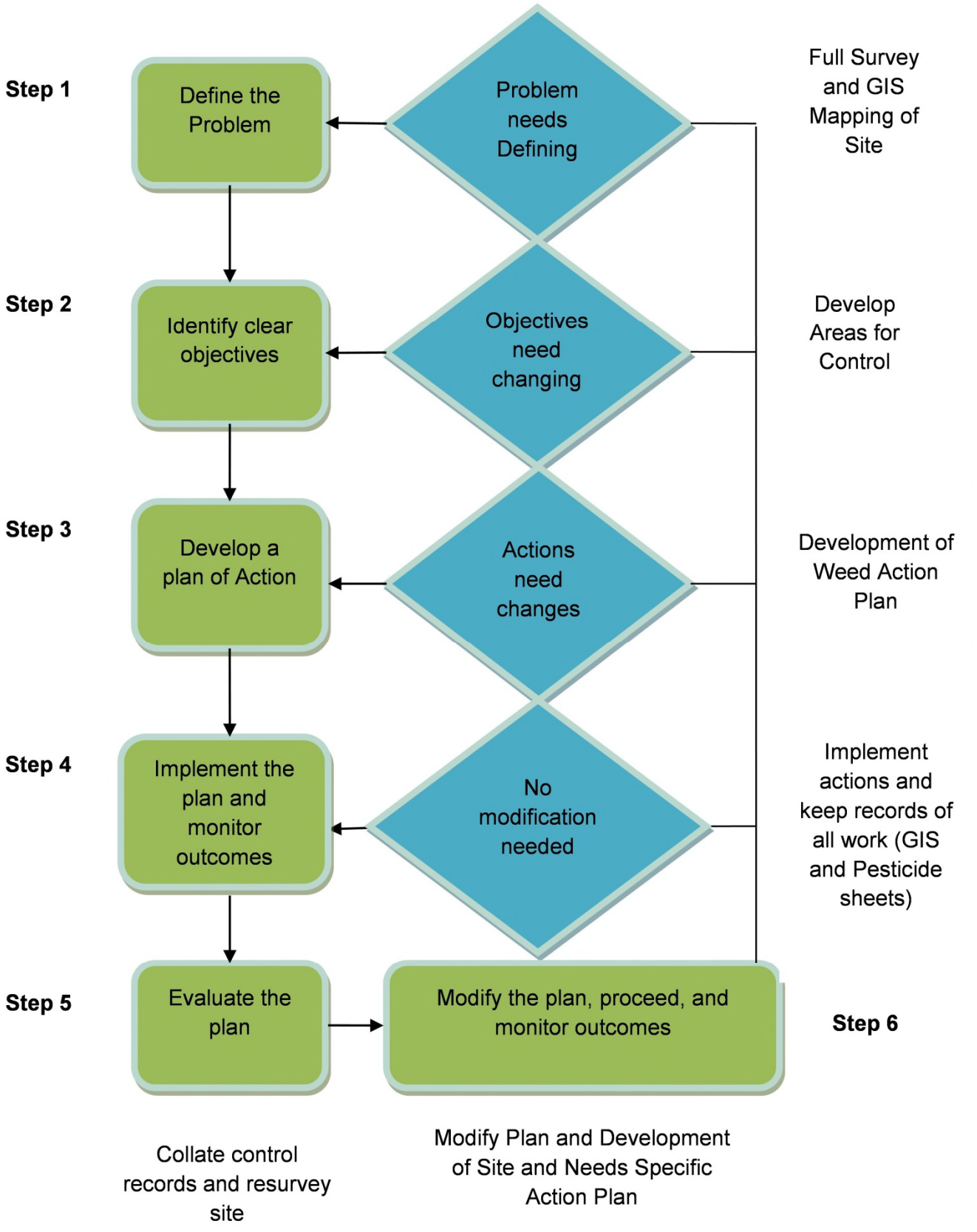

Figure 1 Weed Action Plan development methodology

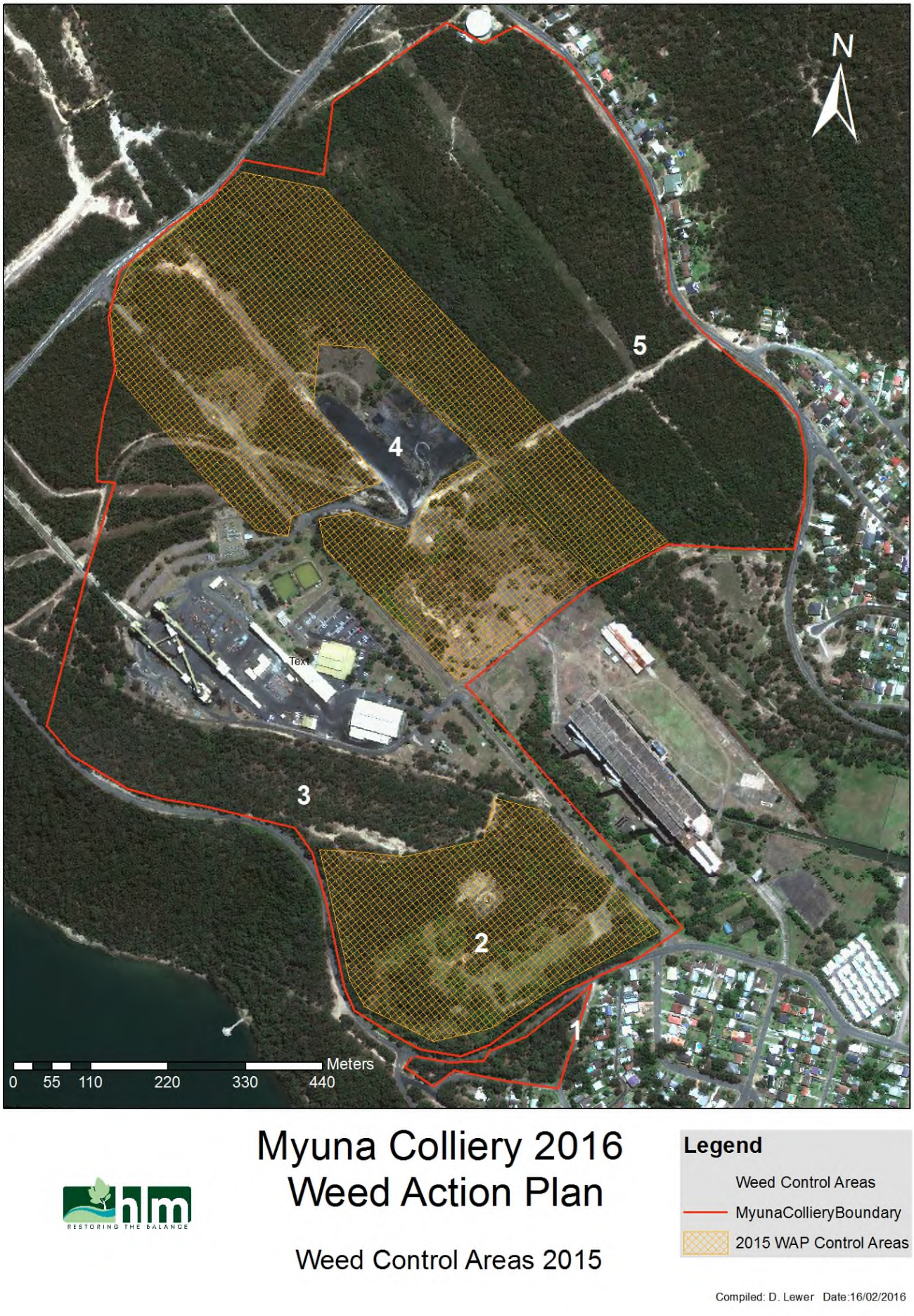

Figure 2 Weed Control Areas 2015

2. Control Approach (2016 Weed Action Plan)

Wangi Creek in Area 5 and 4 was the focus in 2015 and should again be the focal point for 2016 with maintenance crucial to maintain pressure on weeds in this area which is the Groundwater Dependant Ecosystem (GDE) area on site. Area 2 along Summer Hill Drive boundary had an infestation of Lantana and will require ongoing treatment in 2016 and beyond. **Section 3** outlines the areas proposed for control in 2016.

Community members continue to carry out landcare activities along the roadside to reduce weeds and plant local indigenous species. Continual removal of lantana and other weeds along the fence line with will capitalise on this work by removing all mature Lantana and Bitou Bush plants in the area, and is also a low energy opportunity to cultivate positive neighbour relationships through contributing to an existing initiative. This area also represents the disturbed margin above a large expanse of intact bushland with a low weed load. Through being vigilant along the boundary the risk of weed invasion into the high value bushland will be limited. Once primary weeding along the top ridge is complete the area can be designated a maintenance zone and will require only light annual follow up control of emerging seedlings and regrowth.

Working down the hill towards the creek line the lower flats have a higher weed load as moisture availability and disturbance frequency increases. Lantana and Bitou Bush are found along tracks and in mid-story openings. Field teams must leave the existing tracks and move through the bushland as isolated weeds are scattered throughout the vegetation and will need to be treated with cut and paint techniques.

Once the hillside primary weeding has been completed, focus is to remain on Wangi Creek as the secondary focus for 2015. This area will require repeated backpack foliar spray, cut and paint, and isolated high volume spray treatments to bring the Lantana, Crofton Weed, Bitou Bush and Pampas Grass infesting the creek line under control. The main access point will be the gateway located at the south eastern tip of Area 5. This is easily accessed from Donnelly Road and will permit vehicle access in dry weather and all weather access on foot. Weed control will move from this point upstream to Wangi Road.

In addition to this focus, some follow up control will be necessary in treated areas, to capitalise on previous efforts and continue to apply pressure to emerging weed seedlings and regrowth. Area 2 in particular still contains established Lantana, Cape Broom, Bitou Bush, Crofton Weed and Tree Tobacco, which will need to be moved into from areas controlled during 2015. The well-established nature of these infestations and the highly disturbed nature of the landscape makes this a higher energy input area in terms of intervention needed to allow the surrounding native species to establish dominance. Area 2 will require several more years of applied weed control to achieve affective management.

A proposed weed action plan budget which outlines a plan for sixteen days of onsite weed control with a crew of two, and the intended break up of effort over the site is included on Page 14.

As stated above it is considered top priority to work from the top of Area 5's boundary fence to Wangi Creek and these areas are to be completed before carrying out any maintenance program in previously treated areas in order to achieve these desired outcomes.

3. 2016 Target Areas

Myuna Colliery 2016 Weed Action Plan

Target Areas 2016

Legend

- Weed Control Areas
- MyunaColliery Boundary
- 2016 WAP Target Areas

Compiled: D. Lewer Date: 16/02/2016

4. Weed Species Classification and Profile

Table 1 Weed Species Classification and Detail

Weed Name (Common Name) Weed Classification	Description of Infestation/Field Notes	Weed Photograph
Lantana **Noxious Weed Class 4** **Weed of National Significance (WoNS)**	A listed noxious weed, this perennial large shrub is the dominant weed found over the whole site with the exception of dense, natural bushland on the north eastern hill as seen in Figure 4. In heavily disturbed areas it forms a dense mid-story and supresses the growth of native species. In less disturbed areas it is largely found as scattered shrubs within mixed native and weed based vegetation which is easily removed through cut ant paint or hand pulling. In this competitive environment with established and recruiting native vegetation removal has a good chance of success.	
Bitou Bush **Class 4 Noxious Weed**	A list noxious weed, the South African shrub is very well suited to coastal areas where it forms dense monocultures. It is present over most of the site, interspersed with other vegetation as single plants or small clumps. All but the largest plants are easily removed by hand. Persistent ongoing removal will be needed.	
Pampas Grass **Noxious Weed Class 4**	A noxious weed particularly prevalent in disturbed areas such as mines and quarries. This perennial grass has a very high seed load and can outcompete most other vegetation in disturbed areas. Control all plants encountered to limit seed set and distribution.	
Crofton **Noxious Weed Class 4**	Crofton weed is present throughout most wet or occasionally inundated areas in low to medium densities. Ongoing spot spraying and manual removal of isolated plants is required to remove established populations, and prevent the suppression of native species common in dense infestations. Primary infestations are in Areas 2 and 4.	
Easter Cassia **Noxious Weed Class 4**	This noxious weed is a spreading shrub to 3m high, flowering all year with the bright yellow flowers seen to the right, producing large amounts of viable seed in bean like seed pods. Found mostly on disturbed margins in the southern area of the site. Most common around the horse paddock.	

Camphor Laurel **Environmental Weed**	Large, broad tree with glossy leaves, pinkish new growth and a strong smell of camphor from crushed leaves. Invasive and coppice forming, particularly along drainage lines and water ways. This tree is scattered throughout the southern part of the site, largely through regenerating previously disturbed areas. Control with Cut and paint method as encountered.	
Fire Weed **Weed of National Significance (WoNS)**	Native to south eastern Africa it is highly invasive in disturbed areas and pasture. Quickly developing a persistent seed bank it flowers in late winter to early spring. Toxic to livestock primarily through liver damage It is primarily restricted to Area 2, and was treated through foliar spray in 2013. Follow up treatment in 2014 will be needed.	
Cape Broom **Weed of National Significance (WoNS)**	Upright, evergreen shrub from 1-3m, usually with one main stem with many branchlets holding small dark green leaves. Finely hairy on the underside of leaves, bearing clusters of yellow pea like flowers followed by small brown to black seed pods. Highly invasive with weed declarations between category class 4 – 2 around New South Wales. Primarily found in the area surrounding the hose paddock (Area 2) extending into Area 3. Early control before seed set in spring. Plants must be two year old before they reproduce, so ongoing control of young plants is desirable.	
Coolatai Grass **Environmental Weed**	This is an invasive perennial grass that is an environmental weed. Found in association with whisky grass onsite.	
Coral Tree **Environmental Weed**	Widely naturalised, this tree with distinctive scarlet flowers generally found near watercourses and drainage lines has the ability to grow readily from broken branches. Monitor and control populations where they show signs of expansion. Treatment for mature plants is cut and paint or direct injection of herbicide, followed up with foliar spray of regrowth. Note that freshly cut plant material is not to be left in contact with the ground. It must be hung in nearby vegetation and or removed to a designated waste area or facility.	

Spear Thistle **Environmental Weed**	An annual environmental weed of disturbed areas and roadsides. This weed can be treated with spot spraying. Scattered across disturbed and recovering areas of the site opportunistic control should be carried out while targeting high priority species.	
Buchan Weed **Environmental Weed**	An erect bristly herb to 1m with yellow flowers clustered at the top of branched, spike-like inflorescences. A major weed of agricultural cropping areas in South Australia, the infestation is restricted to around the coal stand pad and various dams/creeks nearby. Control optimal via foliar spray before flowering in spring. Control opportunistically at any time.	
Castor Oil **Environmental Weed**	This annual is a spreading, upright shrub to 6m with large dark green palmate leaves often with red veins and coloration. The leaves have a strong, unpleasant smell, with the dusty grey green branches and main stem highly visible. It develops large clusters of spiny seed pods, drying to a ruddy brown. Widespread and common in disturbed land, ongoing management of seedlings and adults is needed.	
Wild Tobacco **Environmental Weed**	An annual environmental weed of disturbed areas and roadsides. This weed can be treated with spot spraying or cut and paint methods	
Whiskey Grass **Environmental Weed**	This invasive perennial grass is an environmental weed of disturbed areas. Stems grow up to 1m long and brown off over summer, revealing a distinctive upright, orange tinged habit. It can also successfully invade undisturbed bushland. Effective control can be achieved through foliar spraying.	

Table 2 Weed Control Calendar and Methodolgy

Species	Scientific Name	Weed Status	Weed Class	Control Requirements	Treatment	Priority	Autumn			Winter			Spring			Summer		
							Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017
Lantana	Lantana camara	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.	Spot Spray Round Up Biactive© 1/100L Spot Spray Starane Advanced© 0.6/100L	High												
Pampas Grass	Cortaderia selloanana	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.	Spot Spray Round Up Attack© 0.625/100L	High												
Bitou Bush	Chrysanthemoides monilifera	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.	Hand Pull/Cut and Paint with Glyphosphate	High												
Crofton	Ageratina adenophora	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.	Spot Spray Round Up Biactive© 1/100L	High												
Cape Broom	Genista monspessulana	WoNS	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Spot Spray Garlon™ 600 0.17/100L	High												
Easter Cassia	Senna pendula	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction.	Spot Spray Round Up Attack© 2L /100L Cut Stump 1 part Round Up Attack© : 1.5 parts water	Med												
Camphor Laurel	Cinnamomum camphora	Noxious	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and	Cut Stump 1 part Round Up Attack© : 1.5 parts water	Med												

				continuously inhibits its reproduction.														
Coral Tree	Erythrina sp	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Cut Stump/Inject 1 part Round Up Attack© : 1.5 parts water	Low												
Coolatai Grass	Hyparrhenia hirta	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Spot Spray (PER11916) Round Up Biactive© 1.3L/100	Low												
Buchan (mustard) Weed	Hirschfeldia incana	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Spot Spray Round Up Attack© 0.45L /100L	Low												
Spear Thistle	Cirsium vulgare	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Spot or Boom Spray Grazon Extra© 0.35/100L	Low												
Purple Top	Verbena bonariensis	Environmental	-	No legislative requirements. Control should be conducted to prevent remove weed from rehabilitation areas.	Spot Spray Round Up Attack© 0.65L /100L	Low												
Castor Oil	Ricinus communis	Environmental	-	No legislative requirements. Control should be conducted to prevent remove weed from rehabilitation areas.	Cut Stump 1 part Round Up Attack© : 1.5 parts water	Low												
Wild Tobacco	Solanum mauritianum	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Cut Stump 1 part Round Up Attack© : 1.5 parts water	Low												
Whiskey Grass	Andropogon virginicus	Environmental	-	No legislative requirements. Control should be conducted to prevent spread into rehabilitation areas.	Spot Spray Round Up Attack© 0.65L /100L	Low												
2016 Weed Survey and creation of 2017 Weed Action Plan																		

Appendix 1. Daily Report Sheet

All chemical applications will require the detailed filling of this record sheet along with GPS data gathered for all areas controlled.

HUNTER LAND MANAGEMENT

PO Box 776, Maitland NSW 2320
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Fax: (02) 4932 1558

DAILY REPORT SHEET
0001

Date:	Site: ☐ Mine Site	Supervisor:	Project Manager:

Job Details

Job numbers	Times		Hours			
	Start Time	Finish Time	Normal Time	Time and a half	Double time	Total

Equipment/Plant used (tick if used)

Ute ☐ Unit No:	Quikspray ☐ Unit No:	Tractor ☐ Make:	Mine radio: ☐	Other: (describe) ☐
Drivers/Operators:		Work Request Number		

Daily Breakdown

Time left depot:	Time arrived on site:	Crib break start/finish time:	Lunch break start/finish time:	Time left site:

Chemical Use Record

Property/Holding: (residential address)	
Applicator's Full Name:	
Sensitive Areas (including distances, buffers): N / W / Treated Area / E / S	Comments (including risk control measures for sensitive areas):

Application Data

Full Label Product Name:		Rate/Dose:	Water Rate @ L/ha:
Permit No.:	Expiry Date:	Additives/Wetters:	
Total L/kg:	Applicators Initials:	Water quality(pH or description):	
Equipment type:	Nozzle Type:	Nozzle Angle:	Pressure:	Date Last Calibrated:

Weather Showers ☐ Overcast ☐ Light Cloud ☐ Clear sky ☐

Rainfall (24 hours before and after)
Before: mm During: mm After: mm

Time (show time in this column)	Temperature °C	Relative Humidity (%)	Wind Speed	Direction	Variability (e.g. gusting)
Start					
Finish					

Description of day's work completed/issues encountered:	Materials Used:

HLM Staff Members Used

Name:	Sign:	O/N Allowance
Name:	Sign:	
Name:	Sign:	
Name:	Sign:	
Name:	Sign:	

Comment from / by Client	
Client sign:	Client Name:

Job Completed ☐ Job Ongoing ☐ Other Works ☐ .....

Appendix 2. Example of proposed Component Update

HLM Land Management Project Report v1

Client	
Project Name/Number	
Date or Date Range (including)	
Client Project Manager	
HLM Staff Involved	
Relevant Invoice/s	
Work Type	✓ Weed Control ☐ Vertebrate Pest Control ☐ Revegetation ☐ Seed Collection ☐ GIS Mapping ☐ Fencing ☐ Erosion Control ☐ Grounds Maintenance ☐ APZ Maintenance ☐ Consulting Project ☐ Bushfire Management ☐ _____
Detailed Work Description (including any Site Supervisor Comments)	
Photos (if applicable)	
Mapping, GIS Points (if applicable)	
Herbicide Application Record Sheets (if applicable)	
Other Land Management Issues encountered (if applicable)	
Recommendations / Further Works / Comments	

APPENDIX 4 Myuna Colliery Groundwater Dependent Ecosystem Monitoring

RESTORING THE BALANCE

Groundwater Dependant Ecosystem Monitoring

Baseline Assessment

Myuna Colliery

Version 2 December 2015

This report was produced for Morgan Gleeson of Centennial Myuna Colliery to outline the results of a baseline assessment of the Groundwater Dependant Ecosystem, Swamp Sclerophyll Forest as per the Biodiversity Management Plan.

SUBMITTED TO	DATE	REVISION
Morgan Gleeson	06/11/2015	Draft V1
Morgan Gleeson	13/01/2016	Draft V2

This document can only be considered as having permission for final distribution if an original signature of an authorized representative of HLM is found below:

13/01/2016

SIGNATURE DATE

Daniel Lewer (Bach. Of Env. Sci.)
Senior Environmental Consultant/Director
HUNTER LAND MANAGEMENT PTY LTD

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Contents

1. Introduction

HLM was contracted by Centennials Coals Myuna Colliery to fulfil requirements outlined in Table 5.4.1 of the sites Biodiversity Management Plan 2015 which states "annual monitoring of GDEs alongside Wangi Creek". The monitoring will be undertaken to meet the performance criteria of the monitoring action which states "No mine-related change to flora or the GDE – Swamp Sclerophyll Forest in monitored locations" which is to be completed Annually. HLM will undertake a baseline assessment of the site in 2015 using vegetation survey methodology (quadrat sampling) for future comparison during annual monitoring. More specifically the relevant sections of the sites Biodiversity Management Plan 2015 include;

1.3.2 Project Approval 10_0080

The aim of this BMP is to outline the management strategies that will minimise the impacts of the proposal towards biodiversity and maintain or enhance biodiversity on the subject site and surrounding areas. More specifically, the objectives of this BMP are to address the requirements stated in the conditions of approval as follows:

Project Approval Condition	**Section of this Management Plan**
Biodiversity Management Plan 28. The Proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:	
(a) submitted to the Secretary within 7 months of the date of this approval;	Section 2.2.1
(b) be prepared by a suitable qualified ecologist approved by the Secretary;	Section 2.2.1
(c) have a particular focus on measures that would be implemented over the life of the mine to protect and enhance the Swamp Sclerophyll Forest on Coastal Floodplains endangered ecological community near Wangi Creek; and	Section 4.3 & 5
(d) include a detailed description of the measures that would be implemented over the life of the mine to ensure that native vegetation and habitat within the surface facilities sites (particularly the Swamp Sclerophyll Forest on Coastal Floodplains endangered ecological community near Wangi Creek) are properly managed, including the procedures for: • weed management (both control and suppression) and monitoring; • protection and enhancement of native vegetation and habitat; • feral animal control; • fire management (including asset protection zones); and • management of public access	Section 5

4.3 Groundwater Dependant Ecosystems

A groundwater dependant ecosystem (GDE) can be described as a specialist ecosystem that relies on groundwater for some or all of its water requirements. GDEs do not always depend entirely upon groundwater, however groundwater plays a significant role in the ecological functions of GDEs and can determine the distribution of such ecosystems. There is no current GDE mapping that covers the study area or surrounding lands, although four vegetation units mapped within the PAA (Riparian Melaleuca Swamp Woodland; Swamp Oak Rushland Forest; Redgum Rough Barked Apple Forest; Swamp Mahogany – Paperbark Forest) are likely to be influenced by groundwater or be partially groundwater dependent. It is unlikely that there will be any significant impacts on these vegetation units or GDEs as a result of the proposed Project established in the groundwater assessment undertaken for the EA (GHD, 2010).

4.5 Endangered Ecological Communities

One EEC, MU37 - Swamp Mahogany Paperbark Forest, was observed within the PAA along a stretch of Wangi Creek. This community is the community consistent with the determination of Swamp Sclerophyll Forest on Coastal Floodplains EEC. As surface subsidence will be limited to a maximum of 20 millimetres and no surface cracking is expected to occur, minimal changes to sub-surface hydrology is expected. Myuna is predicted to have negligible surface impacts and is unlikely to impact on any threatened species, endangered populations or TECs. Nevertheless, as required by the conditions, Centennial will protect and enhance the Swamp Sclerophyll Forest on Coastal Floodplains EEC, particularly along Wangi Creek.

5.2 Flora Monitoring

5.2.1 General Flora

Myuna Colliery is expected to have negligible surface impacts. Surface Subsidence will be limited to a maximum of 20 millimetres in Zone A and no surface cracking or water inflows into the workings are predicted to occur. Due to the negligible surface impacts expected, high intensity monitoring is not considered to be required. As impacts to terrestrial ecology are not expected, mitigation measures will be limited to those prescribed for management at the surface facilities area. In the event that existing subsidence monitoring points indicates that subsidence levels are greater than 20 millimetres on terrestrial areas as a result of Myuna Colliery, a review will be undertaken to identify potential ecological impacts. A rehabilitation program will be considered whereby a significant change in species composition can be demonstrated to have been caused by mining-related activities. Such rehabilitation will occur on an as-needs basis as determined by the Environment & Community Officer. If this is required, monitoring of planted species will be required to ensure success. Weed invasion, seedling growth and erosion are all to be visually monitored and enacted upon if required. The results of these monitoring activities will be included in the Annual Review.

5.2.2 Swamp Sclerophyll Forest on Coastal Floodplains

It is noted that protection and enhancement of this community has been specified in the conditions. A general inspection of the health of this community along Wangi Creek has already been undertaken specifically for this BMP. Visual inspections will be undertaken of this vegetation community along Wangi Creek annually including photographic and floristic inspections.

5.4 Groundwater Dependant Ecosystems

Monitoring of groundwater dependant ecosystems, in relation to subsidence and ground water and surface runoff will prevent detrimental impacts on the GDE (The EEC - Swamp Mahogany Paperbark Forest) occurring

within Wangi Creek and the associated riparian vegetation communities. There will be no impact on downstream Groundwater Dependant Ecosystems. Monitoring of the condition of the Swamp Mahogany Paperbark Forest will ensure and health issues are appropriately addressed.

Action	Performance Criteria	Timing
Monitoring and Reporting		
Visual and flora surveys to determine native and non-native species diversity and abundance. Species composition and photographic data recorded.	No mine-related change to flora in monitored location	Subsidence greater than 20mm
Fauna surveys to determine native and non-native species diversity and abundance. Species composition recorded.	No mine-related change to flora in monitored location	Subsidence greater than 20mm
Annual monitoring of GDEs alongside Wangi Creek.	No mine-related change to flora or the GDE -Swamp Sclerophyll Forest in monitored locations	Annually
Submit an update on this Biodiversity Management Plan in the Annual Review	Annual Review completed & submitted	Annually

2. Site Description

The site is described as a coastal forest on the banks of Lake Macquarie within the Lake Macquarie Council Local Government Area with underground mining being undertake at the site since the early 1990's. The BMP describes the site as;

One EEC, MU37 - Swamp Mahogany Paperbark Forest, was observed within the PAA along a stretch of Wangi Creek. This community is the community consistent with the determination of Swamp Sclerophyll Forest on Coastal Floodplains EEC. As surface subsidence will be limited to a maximum of 20 millimetres and no surface cracking is expected to occur, minimal changes to sub-surface hydrology is expected. Myuna is predicted to have negligible surface impacts and is unlikely to impact on any threatened species, endangered populations or TECs. Nevertheless, as required by the conditions, Centennial will protect and enhance the Swamp Sclerophyll Forest on Coastal Floodplains EEC, particularly along Wangi Creek.

An aerial photographic map can be found below in Figure 1 which describes the monitoring site locations. The four monitoring locations where even distributed through the riparian zone which encompasses the GDE which runs through the mining location to the north of the mining infrastructure.

A modified quadrat assessment tool was used with results of this assessment can be found in the body of the document. Quadrat locations (along with GPS references on the assessment sheets) were marked on site with pink surveyors tape to allow annual comparisons .

Figure 1 Site Overview showing Monitoring Sites

3. Aim and Methods

The aim of this annual monitoring program for the Groundwater Dependant Ecosystem is to measure any changes in vegetation health and composition over time. From this annual monitoring recommendations will be made to protect and enhance the GDE as required in the BMP.

The monitoring technique chosen was a quadrat based assessment with each location GPS referenced for ongoing visits. The 2mx2m quadrat should be randomly chosen in close proximity to the GPS location listed. The GPS reference point for each location can be found on the record sheets in Section 3. The ecosystem factors monitored in the quadrat as per the record sheets include;

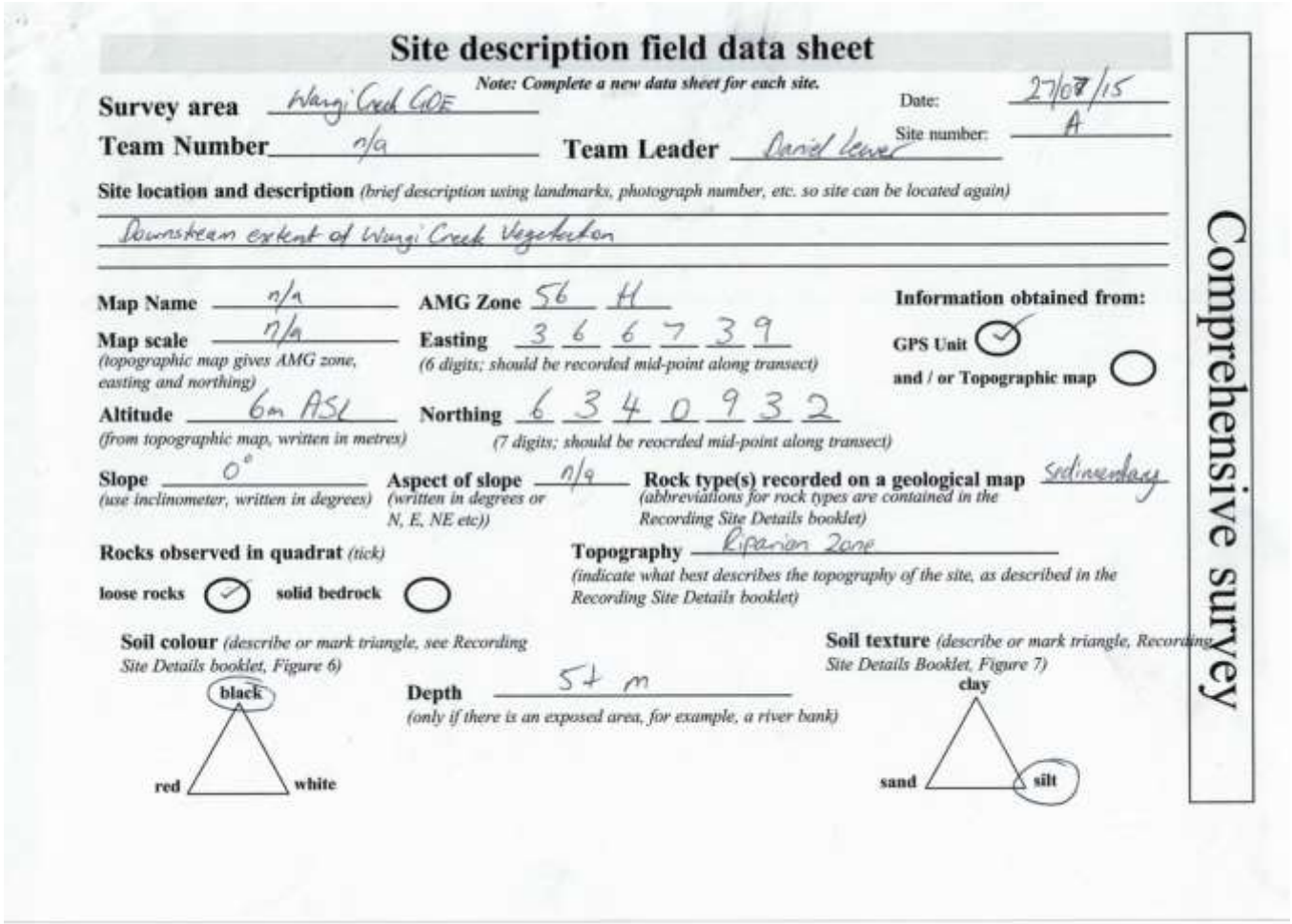
1) Rock Type
2) Topography
3) Soil Colour, Texture and Depth
4) Plant/Leaf Litter and Depth
5) Rock/Stone Density
6) Log and Dead Standing Tree Abundance
7) Fire History
8) Feral Animal Presence
9) Weed Species, Presence and Density
10) Erosion Presence
11) Site Photos (North, East, South West)

At each subsequent annual monitoring visit, these baseline scores can be compared to the previous scores to determine if the GDE is improving or declining and recommendations for works to enhance the sites.

4. Assessment Results

A modified quadrat assessment tool was used to assess each site with results below.

4.1 Site A



Site description field data sheet

Comprehensive survey

Note: Complete a new data sheet for each site.

Survey area Wangi Creek GDE — Date: 27/07/15

Team Number n/a — **Team Leader** Daniel Lever — Site number: A

Site location and description *(brief description using landmarks, photograph number, etc. so site can be located again)*

Downstream extent of Wangi Creek Vegetation

Map Name n/a — **AMG Zone** 56 H

Map scale n/a *(topographic map gives AMG zone, easting and northing)*

Easting 3 6 6 7 3 9 *(6 digits; should be recorded mid-point along transect)*

Altitude 6m ASL *(from topographic map, written in metres)*

Northing 6 3 4 0 9 3 2 *(7 digits; should be reocrded mid-point along transect)*

Information obtained from: GPS Unit ✓ and / or Topographic map ○

Slope 0° *(use inclinometer, written in degrees)*

Aspect of slope n/a *(written in degrees or N, E, NE etc))*

Rock type(s) recorded on a geological map sedimentary *(abbreviations for rock types are contained in the Recording Site Details booklet)*

Rocks observed in quadrat *(tick)*

loose rocks ✓ solid bedrock ○

Topography Riparian Zone *(indicate what best describes the topography of the site, as described in the Recording Site Details booklet)*

Soil colour *(describe or mark triangle, see Recording Site Details booklet, Figure 6)*

Depth 5+ m *(only if there is an exposed area, for example, a river bank)*

Soil texture *(describe or mark triangle, Recording Site Details Booklet, Figure 7)*

Site description field data sheet

Baseline survey

Survey area A

Date: 27/07/15

Site number: A

Team Number n/a **Team Leader** Daniel Lever

Habitat

Plant litter *(measure the depth of litter in centre of the quadrat; the centre of the quadrat should lie on the transect. Write depth in centimetres.)*

Rock *(Found within quadrat that are greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Depth of plant litter	Number of rocks/ stones
1	5m	12cm	0
2	10m	5cm	0
3	15m	8cm	0
4	20m	18cm	0
5			

Fallen logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Fallen hollow logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Hollow dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Number of fallen logs	Number of hollow fallen logs	Number of dead standing trees	Number of hollow dead standing trees
1	5m	1	0	0	0
2	10m	0	0	0	0
3	15m	2	1	0	0
4	20m	1	0	1	0
5					

Site description field data sheet

Comprehensive survey

Survey area A

Date: 27/07/17

Site number: A

Team Number n/a **Team Leader** Daniel Lever

Fire history unknown - no visible evidence
(last fire date)

Landuse *(for example: grazing, cultivation, forestry)*
Current landuse(s) Mining Buffer
Discontinued landuses)

Intensity of fire at site *(tick)*

◯ 1. ground cover burnt ◯ 3. tree-tops burnt

◯ 2. shrubs burnt ◯ 4. trees burnt to the ground

Evidence of feral/dmestic animal(s) at site *(tick)* ✓ no ◯ yes

If *yes* list the evidence

Evidence of weeds at site *(tick)* ◯ no ✓ yes

Percentage of site affected by weed growth 50%

Three most common of weeds at site
Crofton weed
Tobacco Tree
Camphor laurel Tree

Severity of effects (tick)

◯ light evidence
(present but not overwhelming)

✓ moderate evidence
(weeds shading large proprtion of ground surface)

◯ severe evidence
(weeds shading plants as well as ground, maybe strangling mature plants, may have difficulty seeing the ground surface)

Erosion at site *(tick)*

◯ 1. active erosion (happening now)

✓ 2. stabilised erosion (shows signs of revegetation)

◯ 3. partially stabilised (some stable areas, some active areas)

Type of erosion at site

1. wind action (percentage of site scalded) 0%
2. water action a. sheet erosion (landslip; percentage of site effected) 0%
   b. gully erosion (percentage of site effected) 0%
   c. wave erosion (percentage of site effected) 0%

Vegetation structure *(as described in Recording Site Details booklet, Table 2)* Swamp Sclerophyll Forest

Height of tallest plants at site 14-18m

Number of dead trees still standing 2

Number of dead trees lying on the ground 3

Photo : A North

Photo : A East

Photo : A South

Photo : A West

4.2 Site B

Site description field data sheet

Comprehensive survey

Survey area Wongi Creek GDE — **Date:** 27/09/15

Note: Complete a new data sheet for each site.

Team Number n/a — **Team Leader** David Lewer — **Site number:** B

Site location and description *(brief description using landmarks, photograph number, etc. so site can be located again)*

300m upstream from property boundary at western end of weal pool

Map Name n/a — **AMG Zone** 56 H

Map scale n/a *(topographic map gives AMG zone, easting and northing)*

Easting 3 6 6 4 8 1 *(6 digits; should be recorded mid-point along transect)*

Altitude 7m *(from topographic map, written in metres)*

Northing 6 3 4 1 1 6 2 *(7 digits; should be recorded mid-point along transect)*

Information obtained from:

GPS Unit ✓

and / or Topographic map ○

Slope 0 *(use inclinometer, written in degrees)*

Aspect of slope n/a *(written in degrees or N, E, NE etc))*

Rock type(s) recorded on a geological map Sedimentary *(abbreviations for rock types are contained in the Recording Site Details booklet)*

Rocks observed in quadrat *(tick)*

loose rocks ✓ **solid bedrock** ○

Topography Riparian Zone *(indicate what best describes the topography of the site, as described in the Recording Site Details booklet)*

Soil colour *(describe or mark triangle, see Recording Site Details booklet, Figure 6)*

black / red / white

Depth 5+ m *(only if there is an exposed area, for example, a river bank)*

Soil texture *(describe or mark triangle, Recording Site Details Booklet, Figure 7)*

clay / sand / silt

Site description field data sheet

Baseline survey

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: B

Habitat

Plant litter *(measure the depth of litter in centre of the quadrat; the centre of the quadrat should lie on the transect. Write depth in centimetres.)*

Rock *(Found within quadrat that are greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Depth of plant litter	Number of rocks/ stones
1	5m	2cm	0
2	10m	8cm	100+
3	15m	4cm	20
4	20m	12cm	0
5			

Fallen logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Fallen hollow logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Hollow dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Number of fallen logs	Number of hollow fallen logs	Number of dead standing trees	Number of hollow dead standing trees
1	5m	0	0	1	0
2	10m	3	1	0	0
3	15m	0	0	0	0
4	20m	1	0	1	0
5					

Site description field data sheet

Comprehensive survey

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Site number: B

Fire history unknown - no sign *(last fire date)*

Landuse *(for example: grazing, cultivation, forestry)*
Current landuse(s) mining
Discontinued landuses)

Intensity of fire at site *(tick)*

◯ 1. ground cover burnt ◯ 3. tree-tops burnt

◯ 2. shrubs burnt ◯ 4. trees burnt to the ground

Evidence of feral/dmestic animal(s) at site *(tick)* ✓ no ◯ yes

If *yes* list the evidence

Evidence of weeds at site *(tick)* ◯ no ✓ yes

Percentage of site affected by weed growth 20%

Three most common of weeds at site
Lantana
Pampas Grass
Crofton Weed

Severity of effects (tick)

✓ light evidence *(present but not overwhelming)*

◯ moderate evidence *(weeds shading large proprtion of ground surface)*

◯ severe evidence *(weeds shading plants as well as ground, maybe strangling mature plants, may have difficulty seeing the ground surface)*

Erosion at site *(tick)*

◯ 1. active erosion (happening now)

✓ 2. stabilised erosion (shows signs of revegetation)

◯ 3. partially stabilised (some stable areas, some active areas)

Type of erosion at site

1. wind action (percentage of site scalded) 0%
2. water action a. sheet erosion (landslip; percentage of site effected) 0%
   b. gully erosion (percentage of site effected) 0%
   c. wave erosion (percentage of site effected) 0%

Vegetation structure *(as described in Recording Site Details booklet, Table 2)* Swamp Sclerophyll Forest

Height of tallest plants at site 10-12m

Number of dead trees still standing 2

Number of dead trees lying on the ground 3

Photo : B North

Photo : B East

Photo : B South

Photo : B West

Site description field data sheet

Comprehensive survey

Survey area Wang Creek GDE *Note: Complete a new data sheet for each site.* **Date:** 27/07/15

Team Number n/a **Team Leader** Daniel Lewis **Site number:** C

Site location and description *(brief description using landmarks, photograph number, etc. so site can be located again)*

500m downstream from western boundary of site on Wang Creek

Map Name n/a **AMG Zone** 56 H

Map scale n/a **Easting** 3 6 6 3 0 5
(topographic map gives AMG zone, easting and northing) *(6 digits; should be recorded mid-point along transect)*

Information obtained from:
GPS Unit ✓ **and / or Topographic map** ○

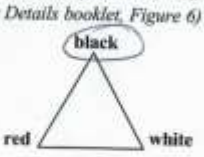
Altitude 14m **Northing** 6 3 4 1 3 0 6
(from topographic map, written in metres) *(7 digits; should be recorded mid-point along transect)*

Slope 0° *(use inclinometer, written in degrees)* **Aspect of slope** n/a *(written in degrees or N, E, NE etc))* **Rock type(s) recorded on a geological map** Sedimentary *(abbreviations for rock types are contained in the Recording Site Details booklet)*

Rocks observed in quadrat *(tick)*
loose rocks ✓ **solid bedrock** ○

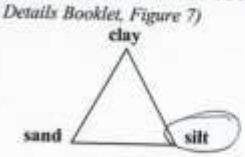
Topography Riparian Zone *(indicate what best describes the topography of the site, as described in the Recording Site Details booklet)*

Soil colour *(describe or mark triangle, see Recording Site Details booklet, Figure 6)*



Depth 5+ m *(only if there is an exposed area, for example, a river bank)*

Soil texture *(describe or mark triangle, Recording Site Details Booklet, Figure 7)*



Site description field data sheet

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: C

Baseline survey

Habitat

Plant litter *(measure the depth of litter in centre of the quadrat; the centre of the quadrat should lie on the transect. Write depth in centimetres.)*

Rock *(Found within quadrat that are greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Depth of plant litter	Number of rocks/ stones
1	5m	20cm	0
2	10m	5cm	29
3	15m	8cm	3
4	20m	18cm	0
5			

Fallen logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Fallen hollow logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Hollow dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Number of fallen logs	Number of hollow fallen logs	Number of dead standing trees	Number of hollow dead standing trees
1	5	0	1	0	0
2	10	0	0	1	1
3	15	0	0	0	0
4	20	0	1	0	0
5					

Site description field data sheet

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: C

Comprehensive survey

Fire history unknown - no visible evidence *(last fire date)*

Landuse *(for example: grazing, cultivation, forestry)*
Current landuse(s) Mining Buffer
Discontinued landuses)

Intensity of fire at site *(tick)*

◯ 1. ground cover burnt ◯ 3. tree-tops burnt

◯ 2. shrubs burnt ◯ 4. trees burnt to the ground

Evidence of feral/dmestic animal(s) at site *(tick)* ✓ no ◯ yes

If yes list the evidence

Evidence of weeds at site *(tick)* ◯ no ✓ yes

Percentage of site affected by weed growth 10%

Three most common of weeds at site
Lantana

Severity of effects (tick)

✓ light evidence *(present but not overwhelming)*

◯ moderate evidence *(weeds shading large proprtion of ground surface)*

◯ severe evidence *(weeds shading plants as well as ground, maybe strangling mature plants, may have difficulty seeing the ground surface)*

Erosion at site *(tick)*

◯ 1. active erosion (happening now)

✓ 2. stabilised erosion (shows signs of revegetation)

◯ 3. partially stabilised (some stable areas, some active areas)

Type of erosion at site

1. wind action (percentage of site scalded) ____
2. water action a. sheet erosion (landslip; percentage of site effected) ____
   b. gully erosion (percentage of site effected) ____
   c. wave erosion (percentage of site effected) ____

Vegetation structure *(as described in Recording Site Details booklet, Table 2)* Swamp Sclerophyll Forest

Height of tallest plants at site 18-20m

Number of dead trees still standing 1

Number of dead trees lying on the ground 2

Photo : C North

Photo : C East

Photo : C South

Photo : C West

4.4 Site D

Site description field data sheet

Comprehensive survey

Survey area Wangi Creek GDE **Note: Complete a new data sheet for each site.** Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: D

Site location and description *(brief description using landmarks, photograph number, etc. so site can be located again)*

Upstream extent of site at Wangi Creek

Map Name n/a **AMG Zone** 56 H

Map scale n/a *(topographic map gives AMG zone, easting and northing)*

Easting 3 6 6 1 8 0 *(6 digits; should be recorded mid-point along transect)*

Information obtained from:

GPS Unit ✓

and / or Topographic map ○

Altitude 15 m *(from topographic map, written in metres)*

Northing 6 3 4 1 4 2 8 *(7 digits; should be reocrded mid-point along transect)*

Slope 0° *(use inclinometer, written in degrees)*

Aspect of slope n/a *(written in degrees or N, E, NE etc))*

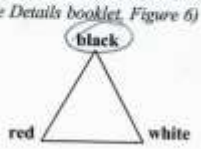
Rock type(s) recorded on a geological map Sedimentary *(abbreviations for rock types are contained in the Recording Site Details booklet)*

Rocks observed in quadrat *(tick)*

loose rocks ✓ **solid bedrock** ○

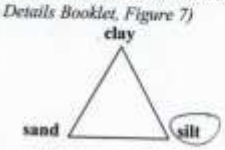
Topography Riparian Zone *(indicate what best describes the topography of the site, as described in the Recording Site Details booklet)*

Soil colour *(describe or mark triangle, see Recording Site Details booklet, Figure 6)*



Depth 5+ m *(only if there is an exposed area, for example, a river bank)*

Soil texture *(describe or mark triangle, Recording Site Details Booklet, Figure 7)*



Site description field data sheet

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: D

Baseline survey

Habitat

Plant litter *(measure the depth of litter in centre of the quadrat; the centre of the quadrat should lie on the transect. Write depth in centimetres.)*

Rock *(Found within quadrat that are greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Depth of plant litter	Number of rocks/ stones
1	5m	14cm	0
2	10m	8cm	14
3	15m	8 cm	5
4	20m	20 cm	0
5			

Fallen logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Fallen hollow logs *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Hollow dead standing trees *(Found within quadrat that have trunks greater than 20 centimetres in diameter)*

Sample area identification number	Distance along transect	Number of fallen logs	Number of hollow fallen logs	Number of dead standing trees	Number of hollow dead standing trees
1	5m	0	0	0	0
2	10m	1	0	0	0
3	15m	0	0	0	0
4	20m	1	1	0	1
5					

Site description field data sheet

Survey area Wangi Creek GDE Date: 27/07/15

Team Number n/a **Team Leader** Daniel Lewer Site number: D

Comprehensive survey

Fire history unknown - no visible evidence *(last fire date)*

Landuse *(for example: grazing, cultivation, forestry)*

Current landuse(s) Mining buffer

Discontinued landuses)

Intensity of fire at site *(tick)*

- ◯ 1. ground cover burnt
- ◯ 2. shrubs burnt
- ◯ 3. tree-tops burnt
- ◯ 4. trees burnt to the ground

Evidence of feral/dmestic animal(s) at site *(tick)* ✓ no ◯ yes

If *yes* list the evidence

Evidence of weeds at site *(tick)* ◯ no ✓ yes

Percentage of site affected by weed growth 5%

Three most common of weeds at site

Lantana

Severity of effects (tick)

- ✓ light evidence *(present but not overwhelming)*
- ◯ moderate evidence *(weeds shading large proprtion of ground surface)*
- ◯ severe evidence *(weeds shading plants as well as ground, maybe strangling mature plants, may have difficulty seeing the ground surface)*

Erosion at site *(tick)*

- ◯ 1. active erosion (happening now)
- ✓ 2. stabilised erosion (shows signs of revegetation)
- ◯ 3. partially stabilised (some stable areas, some active areas)

Type of erosion at site

1. wind action (percentage of site scalded)
2. water action a. sheet erosion (landslip; percentage of site effected)
   b. gully erosion (percentage of site effected)
   c. wave erosion (percentage of site effected)

Vegetation structure *(as described in Recording Site Details booklet, Table 2)* Swamp Sclerophyll Forest

Height of tallest plants at site 16-18m

Number of dead trees still standing 1

Number of dead trees lying on the ground 1

Photo : D North

Photo : D East

Photo : D South

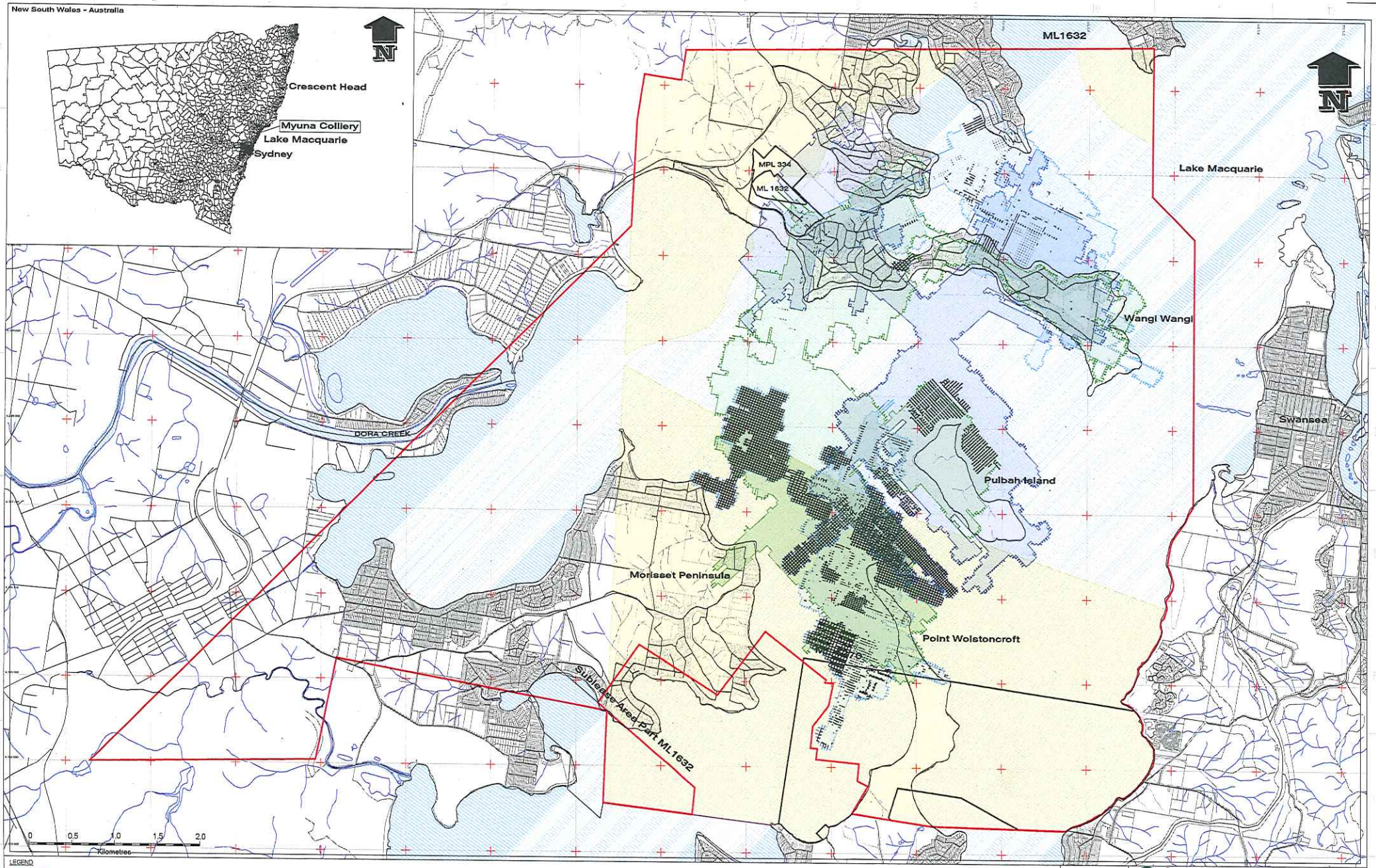
Photo : D West

5. Recommendations

The following recommendations are made to enhance and/or maintain the GDE at the Myuna Colliery Site as a result of this;

1. Weed Control specifically targeting Lantana, Pampas Grass, Crofton Weed and Camphorlaurel Tree should be included in the 2016 Weed Action Plan for the site and the GDE. All sites monitoring sites contain weed species during the inspections.
2. Native endemic tubestock plantings should be undertaken where weed removal/control occurs and the density at the location was greater than 40% weeds. Plantings species should be a mixture of trees, shrubs and grasses endemic to the GDE as listed in the BMP and planted at a density of 1 plant per $2m^2$.

PLAN - MY11434 ANNUAL REVIEW PLAN


New South Wales - Australia
Crescent Head
Myuna Colliery
Lake Macquarie
Sydney
N
ML1632
MPL 334
ML 1632
Lake Macquarie
Wangi Wangi
Swansea
DORA CREEK
Pulbah Island
Morisset Peninsula
Point Wolstoncroft
Sublease Area Part ML1632
0
0.5
1.0
1.5
2.0
Kilometres
LEGEND
MOP Area - Mining Lease ML1632
Mining Leases
Cadastral Boundary
Roads
Water features
Lake Macquarie
Part 3A - Project Approval Area
Wallarah seam workings (February 2016)
Great Northern seam workings (February 2016)
Fassifern seam workings (February 2016)
DRAWN: DH
DATE: 10.02.2016
CHECKED:
DATE:
APPROVED:
DATE:
SCALE 1:20,000
Centennial Myuna
MYUNA COLLIERY
TITLE
AEMR - (Annual Environmental Management Plan)
Annual review plan
CAD FILE N:\shared\PLANS\MY\MY11434.dwg
N:\shared\PLOT\MY\MY11434.pdf
PLAN NO. MY11434
REV. 0
A1