



Centennial Coal

Myuna Colliery

Extension of Mining Project

Response to Submissions

November 2011

FUTURE POWER



Centennial Coal

EXECUTIVE SUMMARY

Myuna Colliery is an existing underground coal mine owned and operated by Centennial Myuna Pty Ltd (Centennial Myuna). Myuna Colliery's Surface Facilities Area is located on the western side of Lake Macquarie, in Wangi Wangi, approximately 25 kilometres south-west of Newcastle, New South Wales (NSW).

In February 2011, Centennial Myuna submitted an Environmental Assessment to the New South Wales Department of Planning and Infrastructure (DP&I) for the Myuna Colliery Extension of Mining Project. The Project is seeking approval for the extension of current operations at Myuna Colliery for a further 21 years including operation of the Surface Facilities Area, as well as mining using bord and pillar methods in the Wallarah, Great Northern and Fassifern coal seams within the Project Application Area. Production and handling of up to 2 Mtpa of run of mine (ROM) coal is sought for the proposed Project, which is within the operational capacities of the existing approved Coal Handling Plant (CHP) located at the Surface Facilities Area.

The Environmental Assessment was prepared in accordance with the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) and specifically with reference to the Director General Requirements (DGR's). The Environmental Assessment was placed on public exhibition from Friday 18 March 2011 until Thursday 21 April 2011.

Fifteen submissions were received by the DP&I in regards to the Myuna Colliery Extension of Mining Project Environmental Assessment during the public exhibition period. Five submissions were received from individuals, one submission was received from the Dams Safety Committee, one submission was received from the Construction, Forestry, Mining and Energy Union, six submissions were received from State Government authorities and two submissions were received from the local councils (Wyang Shire Council and Lake Macquarie City Council). Of the fifteen submissions received, the main concerns raised were in regards to the potential impacts on benthic communities as a result of up to 650 millimetres of subsidence in mining Zone B and water discharge volumes from the Myuna Colliery water management system.

This document has been developed in response to the submissions received by the DP&I and addresses the key concerns raised in those submissions. The document is an appendage to the Environmental Assessment and should be read in conjunction with the Environmental Assessment.

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1 INTRODUCTION

Myuna Colliery is an existing underground coal mine owned and operated by Centennial Myuna Pty Ltd (Centennial Myuna). Myuna Colliery's Surface Facilities Area is located on the western side of Lake Macquarie, in Wangi Wangi, approximately 25 kilometres south-west of Newcastle, New South Wales (NSW).

Development of Myuna Colliery commenced in 1979 and since this time extraction of coal and associated mining activities has occurred in three coal seams (Wallahah, Great Northern and Fassifern) using bord and pillar mining methods. Myuna Colliery has an approved average Run of Mine (ROM) coal production of 1.3 million tonnes per annum (Mtpa), which is transferred to the Surface Facilities Area for processing and transport to the Eraring Power Station using the Eraring Energy owned Enclosed Overland Conveyor.

Myuna Colliery currently operates under an existing Development Consent (SH 110/148) within the Development Consent Mining Area, in accordance with the conditions of relevant mining leases and, in areas beyond the existing Development Consent Mining Area, under the transitional provisions of the Mining Act 1992 (Mining Act).

As the transitional provisions of section 74(1) of the Mining Act will cease on 31 December 2011, and as existing mining operations are not scheduled for completion until 2031, Centennial Myuna requires Project Approval under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) to continue mining beyond this date in those areas outside the existing Development Consent Mining Area and within the existing mining leases.

The Project Application Area encompasses Mining Lease ML 1370, Mining Purpose Lease MPL 334, a portion of Consolidated Coal Lease CCL 762 and the Myuna Colliery Surface Facilities Area. The Project Application Area is external to the existing Development Consent Mining Area, with the exception of the inclusion of the Surface Facilities Area.

The proposed Project will extend mining and coal handling at Myuna Colliery within the Project Application Area and proposes to:

- mine using bord and pillar methods in the Wallarah, Great Northern and Fassifern seams in CCL762 and ML1370, for a further 21 years;
- produce, handle and distribute to Eraring Power Station, up to 2Mtpa using existing infrastructure;
- continue the use of ancillary infrastructure and services for a further 21 years;
- upgrade the water management system; and
- rehabilitate the surface facilities within 5 years of completion of mining.

Project Approval is sought for the continued operation of underground mining activities within the Project Application Area. The Project Application Area encompasses the coal measures and three seams currently mined at Myuna Colliery and, as such, includes areas of existing workings and areas requiring new workings to be developed. Access to new areas will be developed from the existing workings. The proposed method of extraction for these areas is by conventional underground bord and pillar mining methods, similar to methods employed for previous underground mining at the Myuna Colliery.

Centennial Myuna is seeking Project Approval for the continued operation of the Surface Facilities Area. All existing infrastructure located at the Surface Facilities Area and existing mining areas (including existing underground workings for ventilation) will continue to be utilised for the Project including (but not limited to) mine access, emergency management, underground services and infrastructure and the use of the Eraring Energy owned Enclosed Overland Conveyor to transport coal to the Eraring Power Station. As such, no changes are proposed to the current mine access, infrastructure or mine facilities. Minor changes to the licensed discharge point configuration and temporary coal stockpile area (involving minor clean water diversion works) will be required to improve water management at the Surface Facilities Area.

The proposed Project will result in benefits to the local community and economy associated with the continued employment of 210 employees and additional wages, royalties and flow-on effects with a net benefit of 222 Million dollars being injected into regional and State economies over the proposed Projects 21 year life. The proposed Project has been considered in respect of environmental, economic and social grounds and is considered to be consistent with the principles of Ecological Sustainable Development.

2 SCOPE

This report has been prepared in accordance with section 75H(6) of the EP&A Act and considers the matters raised in submissions during the public exhibition of the Environmental Assessment. This report builds on information presented in the Environmental Assessment and is to be read in conjunction with the Environmental Assessment.

3 OVERVIEW OF SUBMISSIONS

Fifteen submissions were received by the Department of Planning and Infrastructure (DP&I) following public exhibition of the Environmental Assessment. Submissions were lodged by individuals, the Construction, Forestry, Mining and Energy Union, the Dams Safety Committee, local councils and State Government authorities. Table 2 illustrates the number of submissions received by category of submitter.

Table 1 - Category of Submitters

Category of Submitter	Number of Submissions Received
Individuals	5
Dam Safety Committee	1
Union	1
State Government Authority	6
Local council	2
Total	15

Table 2 below outlines the key concerns raised in the submissions received and identifies the section within this Response to Submissions report which addresses these concerns.

Table 2 - Key Concerns Raised in Submissions

No.	Concern	Raised By	Summary of Concern	Where Addressed
1.	Subsidence	Individual	Corrective action is ineffective should subsidence occur beyond the stated maximums. How can multi-level extraction guarantee freedom from strata fracture when geological formations cannot in themselves be guaranteed to be uniform between the seams?	Section 5.1
		Individual	Property and Infrastructure in close proximity to the Project Area boundary are still at risk from subsidence.	
		State Government Authority	There is a lack of detail in the Environmental Assessment on the subsidence monitoring proposed for the Project Area. The Office of Environment and Heritage recommends that Centennial Myuna monitors subsidence under	

			terrestrial areas, particularly along Wangi Creek in and around the local occurrence of Swamp Sclerophyll Forest on Coastal Floodplains Endangered Ecological Community (EEC).	
2.	Seagrass Habitat	Local Council State Government Authority	The Environmental Assessment fails to address all water depths where seagrass may grow. Zone A should not just include current seagrass distribution, but should include all water depths where seagrass may grow. This is identified in the ecologists report as water depths up to 5 metres. A seagrass assessment should be undertaken prior to any additional underground mining activities within Zone A and a management strategy developed for monitoring and remedial action to prevent impacts on seagrasses from the proposal.	Section 5.2
3.	Benthic Communities	State Government Authority	The Environmental Assessment does not appear to provide the area or extent of Mining Zone B. Zone B appears to be 13% of the area of Lake Macquarie, and an impact over this area could not be considered localised. Given the benthic assemblages are unlikely to move the considerable distance to "similar habitat" the conclusion that impacts will not be significant is questionable. It is suggested that impacts on benthic assemblages need further investigation prior to mining.	Section 5.3
4.	Creeks and Waterways	State Government Authority	The Environmental Assessment does not provide mitigation strategies for the exceedence of Total Suspended Solids (TSS) above allowable limits to ensure health and water quality of Wangi Creek and Lake Macquarie is enhanced or maintained.	Section 5.4
5.	Lake Macquarie Foreshore	Local Council	The Environmental Assessment fails to address the potential impact of subsidence on the lake hydrology, and how these changes may influence natural foreshore processes including accretion and erosion.	Section 5.5
6.	Noise and Vibration	Local Council Individual	Plant and equipment used underground should be considered acoustically significant to sensitive receptors. Residents don't want any more noise and vibration from the increased extraction, processing and conveyance of coal. Table 7 of the Environmental Assessment provides an estimated Myuna LA90 contribution of 37dBA at Location 2 for day and evening, but proposes a value of 33dBA for night. The colliery however operates continuously 24 hours per day 7 days per	Section 5.6

		State Government Authority	<p>week and no reason is given as to why the noise output should be any less during the night. The Office of Environment and Heritage suggest that the Adopted Background Level (Excluding Myuna) for night time at Location 2 be reduced to 30dBA, the same as for Location 1. This change in the night time Adopted Background Level to 30dBA at location 2 consequently changes the Project Specific Noise Criteria in Table 11 of the Environmental Assessment to 35dBA at night time for all receivers.</p>	
		Individual	<p>Regular vibrations from underground explosions resulting in shaking of house and contents. Inconsistent information has been provided by Centennial Myuna on the use of explosives.</p> <p>A detailed noise management plan should be prepared incorporating mitigation measures recommended in the noise report. The Noise Management Plan should then form part of the Environmental Monitoring Plan for the mine.</p>	
7.	Air Quality	Local Council	<p>The Environmental Assessment should consider within the Air Quality Assessment the likely background levels of fine particles (PM2.5) in the vicinity of the Project Area and when estimating predicted concentrations at sensitive receptors.</p>	Section 5.7
		Individual	<p>Airborne emission measurements have been made at monitors some distance from the Myuna Colliery and Wangi Wangi, and there has been no data collected at the Myuna Colliery. Centennial Myuna should be required to install and monitor air-borne pollutant gauges in built up areas of the Wangi Peninsula to provide accurate measures of local air pollutants.</p>	
		State Government Authority	<p>The Office of Environment and Heritage as part of modernisation of monitoring recommends that new approvals replace ambient monitoring conducted with a requirement to monitor under AM19, this in effect replaces Hi-Volume Air Samplers with TEOM's for ambient PM10 monitoring.</p>	
8.	Aboriginal Heritage	State Government Authority	<p>The Office of Environment and Heritage note in their submission the absence of consultation evidence following the additional field assessment conducted on 11 February 2011. The absence of comments from the registered Aboriginal stakeholders regarding</p>	Section 5.8

		State Government Authority	<p>the results the additional field assessment, details of the significance assessment of the additional Aboriginal sites identifies and comments of support or otherwise of the final management and mitigation options highlights the incomplete consultation process. The Office of Environment and Heritage recommended that the proponent seek the views or opinions of the local Aboriginal community regarding the nature and extent of the outstanding matters to complete the cultural heritage assessment process.</p> <p>Centennial Myuna is advised to promptly complete an Office of Environment and Heritage site recording card for each site and submit to the Office of Environment and Heritage for registration in Aboriginal Heritage Impact Management System.</p>	
9.	European Heritage	State Government Authority	<p>The Cultural Heritage Assessment does not adequately address the impacts the proposed Project may have on Non-Aboriginal heritage items. RPS did not include an assessment of significance for the rail line, which is associated intimately with a state significant item. This needs to be amended with an assessment of significance and any appropriate mitigation measures identified. There has been no attempt to assess whether the proposed Project will have any impact on the State Heritage Listed Wangi Power Station situated adjacent to the Project Area.</p>	Section 5.9
10.	Water Management	State Government Authority	<p>The proponent proposes to combine Licence Discharge Point (LDP) 1 and LDP 2 to become LDP B. The Office of Environment and Heritage has no objections to the merger of these two discharge points. The current discharge limit for LDP 1 is 12ML/day, and LDP 2 is 1ML/day therefore this combined volumetric discharge limit for LDP1 is revised to reflect the commitments in the EA to 8.6ML/Day.</p> <p>The NSW Office of Water (NOW) recommends that the Water Management Plan be updated based upon any updates to the site water balance and trigger levels and is submitted to NOW for review within 6 months of project approval.</p>	Section 5.10
11.	Rehabilitation and Mine Closure	State Government Authority	<p>The Environmental Assessment does not provide sufficient detail on rehabilitation, mitigation works and mine closure to allow the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) to adequately assess the proposal.</p>	Section 5.11

		State Government Authority	<p>The Environmental Assessment does not adequately address the issues raised in the DTIRIS response to the Environmental Assessment adequacy review. It is recommended that the proponent provide additional conceptual information outlining rehabilitation options that include:</p> <ul style="list-style-type: none"> • Sealing underground entries • Sealing of boreholes and other disturbed areas • Method of linking the final landform with the pre-existing land use and any offset areas <p>Description of feasible rehabilitation domain and propose strategic completion criteria for each domain having regard to the various stages of rehabilitation and outline proposed timeframes for progressive rehabilitation.</p>	
12.	Threatened Species	State Government Authority	<p>Concerns over the intensity and timing of biodiversity surveys conducted on site for threatened species. The final Environmental Assessment did not contain information on the current condition of the Swamp Sclerophyll Forest on Coastal Floodplains EEC on Wangi Creek downstream of the Surface Facilities Area.</p>	Section 5.12
13.	Social Assessment	Individual	<p>The Social Assessments does not take into consideration the increased impact of subsidence on low lying land fringing Lake Macquarie. Any subsidence beyond the Zone A levels will still negatively impact the value of this low lying land.</p>	Section 5.13
14.	Consultation	Individual	<p>Centennial Myuna have had minimal success notifying Wangi residents of the impending development application.</p>	Section 5.14
15.	Sea level rise.	Local Council	<p>Consideration of the NSW Government Sea Level Rise Policy Statement has not been addressed.</p>	Section 5.15
		State Government Authority	<p>The Environmental Assessment should address cumulative impacts of sea level rise as an external impact in combination with the impacts of the mine. The significance of sea level should be considered in terms of impacts on aquatic ecology.</p>	
		State Government Authority	<p>The Environmental Assessment does not consider the combined effects of mine subsidence, predicted sea level rise and decreases in light attenuation on benthic</p>	

			ecology.	
16.	Soils	Local Council	The Environmental Assessment fails to consider the potential impacts of soil contamination as a result of surface operations, the activation of acid sulphate soils due to lowering of the water table or surface cracking as a result of subsidence.	Section 5.16
17.	Earthquakes	Individuals	There is no reference in the Environmental Assessment to the possible impacts of seismic activity.	Section 5.17
18.	Foreign Ownership	Individuals	Centennial Coal has been purchased by a foreign company. There is now an increased likelihood that more Myuna coal will be exported; if so there will be more road transport from the Myuna Colliery.	Section 5.18
19.	Plans and Policies	Local Councils & State Government Authority	The Environmental Assessment did not consider: <ul style="list-style-type: none"> • State Environmental Planning Policy Clause 12 - Concerns with regards to Amendment No 33 of Lake Macquarie LEP 2004; • Wyong Development Control Plan 05 Ch 13 – Interim Conservation Area; and • Draft North Wyong Structure Plan. 	Section 5.19
20.	Eraring Ash Dam	Dam Safety Committee	The Eraring Ash Dam is a significant dam that forms part of the ash disposal system of Eraring power Station and has a Significant Hazard Rating as a consequence of the appreciable economic and environmental damage failure of the dam would cause.	Section 5.20

4 CONSULTATION

This section outlines the additional consultation which has occurred since the submission of the Environmental Assessment in February 2011.

4.1 Community

Community consultation undertaken was in accordance with the Director General's Requirements (DGR's) issued for the Environmental Assessment. The Environmental Assessment was publically exhibited from Friday 18 March to Thursday 21 April 2011. During this period a total of five submissions were received from the community. Of these five submissions;

- 2 submissions were received from residents in support of the Project; and
- 3 submissions were received from residents in objection to the Project. A meeting was held with one of these residents on 9 February 2011 after receiving a letter regarding the Environmental Assessment prior to public exhibition.

4.2 Estuary Management Committee

A presentation was given to the Estuary Management Committee, which is run by Lake Macquarie City Council, on 6 April 2011. No issues in regards to the Project were raised by the Estuary Management Committee.

4.3 Office of Environment and Heritage

A meeting was held with the Office of Environment and Heritage on 6 May 2011 to provide an overview of the project, and to discuss the investigations and actions proposed to manage and mitigate potential impacts on benthic organisms. The Office of Environment and Heritage agreed in principal to the approach proposed by Centennial Myuna to address the issue of potential impacts from subsidence on benthic communities.

4.4 Department of Planning and Infrastructure

A meeting was held with representatives from Centennial Myuna and the Department of Planning and Infrastructure at the Myuna Colliery on 22 September 2011. The meeting was designed to discuss the specific mining methods utilised at Myuna Colliery and provide a clearer understanding of the types of mining activities that will be undertaken within Zone A, Zone B and the transition area. The site visit also provided an opportunity for the Department of Planning and Infrastructure representative to visit the underground mine workings.

5 RESPONSE TO SUBMISSIONS

Centennial Myuna provides the following responses to the submissions and key issues summarised in Section 3.

5.1 Subsidence

Corrective action is ineffective should subsidence occur beyond the stated maximums. How can multi-level extraction guarantee freedom from strata fracture when geological formations cannot in themselves be guaranteed to be uniform between the seams?

A subsidence assessment was undertaken by Seedsman Geotechnics Pty Ltd to support the Myuna Colliery Extension of Mining Project and was provided as Appendix C to the Environmental Assessment. The assessment undertaken by Seedsman Geotechnics Pty Ltd identified a process by which the mine can be designed to meet the specified subsidence constraints for Zone A and Zone B. The subsidence assessment states that these methods are soundly based on published engineering principles and experience at underground mines in the vicinity of Myuna Colliery, as well as more than 28 years of mining at Myuna Colliery. Mining methods for Zone A areas will be based on bord and pillar method by designing the pillars to have very high stability levels, equivalent to a probability of failure of less than 1:1,000,000. Surface subsidence will be less than 20 millimetres. In Zone A, the limitation to less than 20 millimetres of vertical subsidence means there can be no “extraction panels”, only roadways with a bord and pillar layout. There is a very strong precedent for stable bord and pillar mining layouts at the depths being considered to produce no measurable or discernable surface impacts (Seedsman 2010 pg. 17).

As discussed within the Environmental Assessment, the mine layout to be implemented within the three seams of the Project Application Area will be determined during the detailed mine planning process, and will include development of a geotechnically engineered mine design. All mine workings for the current operation are designed in accordance with the Myuna Colliery Mine Planning and Design Document (HSMS-SC-D-11) (CMPL, 2010) which forms part of the Myuna Health and Safety Management System (HSMS). The Myuna Colliery Mine Planning and Design Document provides the framework from which Myuna Colliery manages hazards and risks which have the potential to cause impacts to the safety of personnel working in the mine, or the wider environment. Attachment 1 to this Response to Submissions provides a summary of the mining methods that will be utilised by Centennial Myuna within the three different coal seams and across the different mining zones (Zone A, Zone B and the transition zone) within the Project Application Area to achieve the subsidence constraints and maintain safety at the Myuna Colliery.

Property and Infrastructure in close proximity to the Project Area boundary are still at risk from subsidence.

Mining activities will be undertaken within the Project Application Area and the existing Development Consent boundary only. The Project Application Area is within a Mine Subsidence District for which CMPL pays levies under the Mine Subsidence Compensation Act. The proposed Project will restrict subsidence of land areas within these Subsidence Districts to less than 20 millimetres, and as such potential negative impacts on surface improvements (buildings, infrastructure, roads etc.) will be minimal.

There is a lack of detail in the Environmental Assessment on the subsidence monitoring proposed for the Project Area. The Office of Environment and Heritage recommends that Centennial Myuna monitors subsidence under terrestrial areas, particularly along Wangi Creek in and around the local occurrence of Swamp Sclerophyll Forest on Coastal Floodplains Endangered Ecological Community (EEC).

It is highly unlikely that greater than predicted subsidence will occur within the Project Area. As is identified within section 5.2.3 of the Environmental Assessment, subsidence surveys and monitoring programs at Myuna Colliery will continue to be undertaken in accordance with government requirements to monitor subsidence within the High Water Level Subsidence Control Zone (HWLSCZ) and under the land. Twenty millimetres of subsidence is well within the usual shrink/swell range for the district. Delaney et al (2005) states:

“The observed reactive soil ground surface movements in open ground areas across the region range between 7 mm and 58 mm with an average of 29 mm...”

As such subsidence monitoring using radar images would not be able to determine the difference between subsidence levels and natural ground surface movements over land for the levels of subsidence predicted for the proposed Project.

5.2 Seagrass Habitat

The Environmental Assessment fails to address all water depths where seagrass may grow. Zone A should not just include current seagrass distribution, but should include all water depths where seagrass may grow. This is identified in the ecologists report as water depths up to 5 metres.

Centennial Myuna recognise that the extent of seagrass beds are not static and may fluctuate over time. As such the Environmental Assessment has detailed management and mitigation measures which take the potential extent of seagrass beds into consideration. These commitments include:

- The establishment of a Seagrass Management Zone (SMZ) within Mining Zone B adjacent to the Zone A boundary to minimise the potential for impacts to seagrass at the interface between the two zones. As seagrass distribution is strongly influenced by depth and was not observed to occur in water greater than 5 metres within the Project Application Area, the extent of the SMZ will include the area from the lake-ward edge of the existing seagrass beds out to the 5 metre depth contour across the Project Application Area. Where seagrass beds occur at the edge of the 5 metre contour, the SMZ extends out to approximately the 6 metre depth contour to allow a sufficient buffer. The SMZ will also delineate the area where future seagrass monitoring may be required should secondary mine workings take place in Mining Zone B; and
- The development of a Seagrass Management Plan which will include the requirements for seagrass surveys and monitoring within the SMZ which will be undertaken should secondary workings (partial or full pillar extraction) take place beneath the SMZ. Monitoring requirements will be determined using a risk based approach and in consultation with the Office of Environment and Heritage, targeting the locations where the potential surface impacts of mining within Zone B are predicted to be greater than 20 millimetres within the SMZ. Seagrass monitoring surveys will verify the lake-ward edges of seagrass beds and include observations before, during and after mining activity, to detect any effects that might warrant more detailed quantitative field investigations.

In addition to establishing a SMZ within the Project Application Area, Centennial Myuna has identified the area and extent of seagrass habitat around the Pulbah Island State Conservation Area located within the existing Development Consent Area for the Myuna Colliery. To ensure the protection of seagrass habitat around Pulbah Island, Centennial Myuna will establish a SMZ around Pulbah Island as well. The SMZ around Pulbah Island will have the same levels of controls applied to it as identified above and described in detail within the Environmental Assessment. A revised figure 7 from the Myuna Colliery Extension of Mining Project Aquatic Ecology Assessment has been included in this Response to Submission which details the location of seagrass beds and the associated SMZ around Pulbah Island.

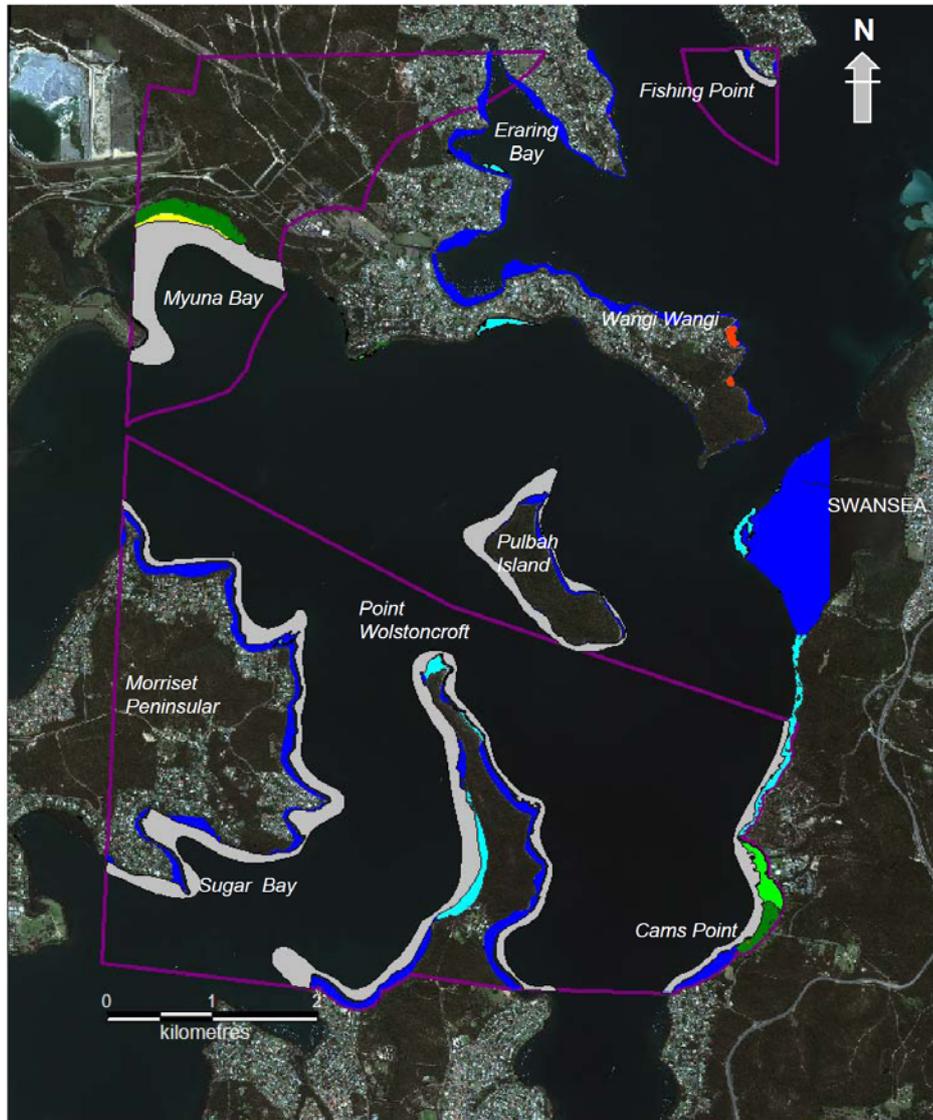
A seagrass assessment should be undertaken prior to any additional underground mining activities within Zone A and a management strategy developed for monitoring and remedial action to prevent impacts on seagrasses from the proposal.

An Aquatic Ecology Assessment was undertaken by Cardno Ecology Lab for the proposed Project and is discussed in section 10.4 and provided in Appendix I of the Environmental Assessment. Field investigations carried out as part of the Aquatic Ecology Assessment and previous habitat mapping carried out within Lake Macquarie (Creese et al. 2009) shows seagrass beds fringing the majority of the foreshore within the survey area and Project Application Area

As discussed in Section 6.0 of the Environmental Assessment, the proposed Project, if approved, will limit subsidence levels to less than 20 millimetres under all land, foreshore and seagrass areas. Cardno Ecology Lab (2010) considered that, as the boundary of Mining Zone A represents the existing extent of seagrass beds within the Project Application Area, and as subsidence levels of less than 20 millimetres are proposed in Mining Zone A, impacts to seagrass beds are not expected to be perceptible as a result of the proposed Project.

Figure 1 – Revised Seagrass Habitat and SMZ Plan to Include Pulbah Island

Myuna Colliery Extension of Mining – Aquatic Ecology Assessment
 Prepared for AECOM



Source: AECOM

KEY			
	High density <i>Zostera</i>		High density <i>Zostera</i> & <i>P. australis</i>
	Low density <i>Zostera</i>		High density <i>H. ovalis</i>
	High density <i>Zostera</i> & <i>H. ovalis</i>		Seagrass Management Zone
	Low density <i>Zostera</i> & <i>H. ovalis</i>		Project Application Area

Figure 7: Seagrass Management Zone, Lake Macquarie.

5.3 Benthic Communities

The Environmental Assessment does not appear to provide the area or extent of Mining Zone B. Zone B appears to be 13% of the area of Lake Macquarie, and an impact over this area could not be considered localised. Given the benthic assemblages are unlikely to move the considerable distance to “similar habitat” the conclusion that impact will not be significant is questionable. It is suggested that impacts on benthic assemblages need further investigation prior to mining.

The aquatic ecology assessment undertaken by Cardno Ecology Lab, discussed in section 10.4 and provided in Appendix I of the Environmental Assessment, considers the potential impacts of the proposed Project on benthic communities. The bed of Lake Macquarie is relatively flat and in the deeper areas consists of fine, dark, soft silt. The diversity and abundance of species found in these benthic sediments during previous surveys by the Ecology Lab is typical of that expected in a temperate NSW estuary. Previous surveys of benthic assemblages within Lake Macquarie reported a relatively diverse assemblage of invertebrates, including several different families of polychaete worms, crustaceans and gastropod and bivalve molluscs.

Mining Zone B is located in water depths of between 2 to 11 metres and contains no seagrasses, relatively few foliose macroalgae due to depressed light penetration, and has water quality considered “marginal” (Lake Macquarie Water Quality Report Card, Office of Lake Macquarie & Catchment Co-ordinator, 2002). Mining Zone B covers a combined total area of approximately 20.23 km², representing 17.7% of the total waterway area of Lake Macquarie. Cardno Ecology Lab identified that localised subsidence of up to 650 millimetres predicted for mining Zone B will likely result in localised alterations in species composition due to depth change. Given the large area of similar habitat within Lake Macquarie for these species, localised changes to benthic soft sediment assemblages as a result of subsidence and increase in water depth will not be significant.

As was described in the Environmental Assessment, mining within Zone B will be determined based on a geotechnically engineered mine design taking into consideration relevant geological information before any secondary extraction is undertaken. The 650 millimetres is an upper limit of predicted subsidence for mining within Zone B and planning considerations for mine design which consider safety requirements as a priority are likely to result in subsidence levels less than the 650 millimetres assessed (Seedsman 2010 pg.17 Appendix C).

In addition, section 10.4.4 of the Environmental Assessment details that prior to undertaking secondary workings in Zone B, Centennial Myuna will commit to the development of an Extraction Plan. In relation to the benthic communities of Lake Macquarie, 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
- 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.

In order to address this commitment, Centennial Myuna would establish a predictive model to assess the impacts of subsidence and reduced light attenuation on benthic communities within Lake Macquarie specifically for mining in Zone B. The investigations would be undertaken prior to any secondary extraction and would inform management actions that will avoid or minimise predicted impacts on benthic communities. Such management actions may include the revision of the footprint for secondary extraction to minimise impacts in critical areas or depths. Details of the predicted impacts and proposed management or mitigation measures would be detailed in future extraction plans required to be approved prior to secondary extraction occurring.

The submission by the Office of Environment and Heritage indicates that an outcome of a meeting on 6 May 2011 between the Office of Environment and Heritage representatives and Centennial Myuna was for Centennial Myuna to conduct a high resolution bathymetric survey of the lake bed in and adjacent to the Project Area. Any requirement to undertake bathymetric survey will be based on risk, water depth, detailed mine designs, refined subsidence predictions and described in an Extraction Plan. Utilising a risk based approach will determine what and where additional data, if any, is required to develop a predictive model and assess impacts of subsidence on benthic communities as part of the extraction plan process. Centennial Myuna will, wherever possible, source and utilise existing bathymetry data.

5.4 Creeks and Waterways

The Environmental Assessment does not provide mitigation strategies for the exceedence of Total Suspended Solids (TSS) above allowable limits to ensure health and water quality of Wangi Creek and Lake Macquarie is enhanced or maintained.

A Water Assessment was undertaken by GHD to assess existing surface water conditions at Myuna Colliery and to determine the potential impact of the proposed operations on current and proposed water systems. The Water Assessment is discussed in Section 10.2 and provided in Appendix G of the Environmental Assessment.

Surface water runoff within the Myuna Colliery Surface Facilities Area is conveyed within a number of natural and constructed flow paths. Watercourses that originate in or pass through the Project Application Area all contribute to Lake Macquarie.

The Surface Facilities Area is located within the Wangi Creek catchment and covers approximately 23% of the creek catchment. Myuna Colliery does not extract water from natural watercourses, however it does discharge both groundwater and rainfall runoff into Wangi Creek, through LDP001 and LDP002.

The Environmental Assessment does note that exceedences of the Myuna Colliery criteria for Total Suspended Solids (TSS) occurred in 7% of discharges through LDP002. The Environmental Assessment does note that the most likely cause of exceedences is considered to be the presence of algae. This is being investigated separately by the Myuna Colliery. The Environmental Assessment provided an assessment of water quality data for the upstream, downstream, LDP001 and LDP002 locations. The Assessment indicated that the quality of water leaving the Project Application Area was typically better than the water quality of the receiving waters in Lake Macquarie.

The proposed Project includes the construction of clean water diversions for catchments contributing to the Coal Handling Plan (CHP) Dam. This will reduce the clean water catchment contributing to the CHP Dam from approximately 8.2 hectares to approximately 4.5 hectares, which will have an overall effect of reducing strain on the capacity of the CHP Dam during rainfall events. Discharges through LDP002 will decrease as a result of the clean water diversions within the Surface Facilities Area and consequently reduce the likelihood of future exceedences of the Myuna Colliery water quality criteria.

The Environmental Assessment also states that the existing water quality monitoring program at Myuna Colliery for the monitoring points 'Upstream', 'Downstream', and combined discharge point LDP B be maintained for the life of the proposed Project. The parameters monitored will be increased, with sampling to be undertaken on a monthly basis for a period of two years, to establish natural background concentrations from water quality data collected for at least 24 samples. The samples will be analysed for the suite of parameters identified in Section 6.3 of the Water Assessment Report provided in Appendix G of the Environmental Assessment.

A review of the Environment Protection Licence (EPL) 366 in February 2011 included a Pollution Reduction Program (PRP) for the assessment of potential impacts of metals discharging from the premises.

U1.1 Upon completion of 24 months of monitoring for metals the licensee must within two months conduct an assessment of metals detected in wastewater discharges from the mine in accordance with ANZECC water quality guidelines and provide this assessment to the EPA Regional Manager Hunter within one month.

5.5 Lake Macquarie Foreshore

The Environmental Assessment fails to address the potential impact of subsidence on the lake hydrology, and how these changes may influence natural foreshore processes including accretion and erosion.

A High Water Level Subsidence Control Zone (HWLSCZ) exists around the foreshore of Lake Macquarie. The HWLSCZ is defined in the seam by a line defined by an angle of draw of 35 degrees drawn lakewards. Vertical subsidence measured within the HWLSCZ at Myuna Colliery throughout the 28 years of mining has been less than 20 millimetres.

Mine design at Myuna Colliery takes into consideration the overlying surface features and their sensitivity to the effects of subsidence. Mining Zone A will be a long term stable mining system generating up to 20 millimetres of subsidence (i.e. no noticeable surface impacts) on sensitive surface features including land and seagrass beds. The mine plan will also be designed such that mining using Zone B mining systems will be undertaken with an angle of draw of 26.5 degrees from the boundary of Zone A to transition between the two zones and limit subsidence to 20 millimetres at the boundary of Zone A. As such the proposed Project will have no impacts on the lake foreshore or the lake hydrology and its natural processes.

5.6 Noise and Vibration

Plant and equipment used underground should be considered acoustically significant to sensitive receptors. Residents don't want any more noise and vibration from the increased extraction, processing and conveyance of coal.

SLR Consulting (previously Heggies Pty Limited) was commissioned to undertake a Noise Impact Assessment (NIA) for the proposed Project which is discussed in section 10.3 and included in Appendix H of the Environmental Assessment. The scope of the assessment was to identify the potential impacts of the proposed Project in relation to noise from the Surface Facilities Area and vibration from underground shot firing and to provide advice with regard to effective mitigation strategies, where necessary.

The NIA was prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise Parts 1, 2 and 3* and in accordance with the Office of Environment and Heritage's *NSW Industrial Noise Policy* (INP). Where issues relating to noise are not addressed in the INP, such as sleep disturbance, reference was made to the NSW Environmental Noise Control Manual (ENCM) and the Environmental Criteria for Road Traffic Noise (ECRTN).

The Noise Assessment completed for the proposed Project identified that operational noise levels are predicted to 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.

Table 7 of the Environmental Assessment provides an estimated Myuna LA90 contribution of 37dBA at Location 2 for day and evening, but proposes a value of 33dBA for night. The colliery however operates continuously 24 hours per day 7 days per week and no reason is given as to why the noise output should be any less during the night. The Office of Environment and Heritage suggest that the Adopted Background Level (Excluding Myuna) for night time at Location 2 be reduced to 30dBA, the same as for Location 1. This change in the night time Adopted Background Level to 30dBA at location 2 consequently changes the Project Specific Noise Criteria in Table 11 of the Environmental Assessment to 35dBA at night time for all receivers.

An ambient noise monitoring program (attended and unattended) was undertaken by SLR Consulting at two locations in proximity to the Surface Facilities Area which are representative of the nearest potentially affected private receivers. Background noise (LA90 - the A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured) and average noise levels over a 15 minute period (LAeq(15minute)) noise levels were measured during the day, evening and night-time periods to determined appropriate background levels. These background levels were used to determine project specific noise criteria for the proposed Project.

Table 7 of the Environmental Assessment provides an estimated Myuna LA90 contribution of 37dBA at Location 2 for day and evening, but proposes a value of 33dBA for night. The Myuna Colliery operates continuously 24 hours per day 7 days per week and no reason is provided within the Environmental Assessment as to why the noise output should be any less during the night. While Myuna Colliery is currently licensed (and seeks to continue) to operate continuously 24 hours per day seven days per week, Centennial Myuna notes that the existing noise management measures which were in place at the site during the noise monitoring period for the Noise Impact Assessment included limits on the night time operation of the coal processing plant. As such, night time background noise emission levels from the Myuna fixed plant did not include any contribution from any of the coal processing plant including the crusher and rotary breaker and, hence, were lower than those during the daytime and evening. SLR Consulting believes that the adopted background noise levels are correct and changes to the project specific noise levels are not necessary.

Regular vibrations are experienced from underground explosions resulting in shaking of the house and contents. Inconsistent information has been provided by Centennial Myuna on the use of explosives.

On rare occasions over its history, Myuna Colliery has been required to undertake underground shot firing when intrusions such as volcanic dykes impede the mine workings. Similarly, limited underground shot firing may therefore be required for the proposed Project. The Noise Impact Assessment provided in Appendix H of the Environmental Assessment assessed the vibration from underground shot firing and it is predicted to be negligible and below levels of human perception at the nearest residential locations. Centennial Myuna records show that shot firing is infrequent and has not been conducted at Myuna Colliery since October 2004. Any shot firing required as part of this proposed Project will be conducted in accordance with the relevant guidelines to reduce any vibration impacts.

A detailed noise management plan should be prepared incorporating mitigation measures recommended in the noise report. The Noise Management Plan should then form part of the Environmental Monitoring Plan for the mine.

As identified in section 11 of the Environmental Assessment, Centennial Myuna has committed to update the existing Myuna Colliery Noise Management Plan. The objectives of the Noise Management Plan are to detail noise mitigation and management strategies and noise monitoring at Myuna Colliery. The Noise Management Plan will be updated to include the recommendations detailed within the Myuna Colliery Noise Impact Assessment. This is proposed to be completed within 6 months of Project Approval.

5.7 Air Quality

The Environmental Assessment should consider within the Air Quality Assessment the likely background levels of fine particles (PM_{2.5}) in the vicinity of the Project Area and when estimating predicted concentrations at sensitive receptors.

The Air Quality Impact Assessment prepared by SLR Consulting (previously Heggies Pty Limited) for the proposed Project assessed the potential cumulative air quality impacts of the proposed Project which largely reflects the ongoing operation of Myuna Colliery's Surface Facilities Area, in addition to existing local pollutant sources. Air Quality is discussed in section 10.1 of the Environmental Assessment. The complete Air Quality Impact Assessment is provided in Appendix F of the Environmental Assessment.

The Air Quality Impact Assessment was prepared in accordance with the Office of Environment and Heritage's Approved Methods for the Modelling and Assessment of Air Pollutants in NSW and assesses compliance with the Office of Environment and Heritage air quality criteria.

Airborne emission measurements have been made at monitors some distance from the Myuna Colliery and Wangi Wangi, and there has been no data collected at the Myuna Colliery. Centennial Myuna should be required to install and monitor air-borne pollutant gauges in built up areas of the Wangi Peninsula to provide accurate measures of local air pollutants.

As has been identified within the Environmental Assessment, the proposed Project will contribute between 1.2 and 15.6 µg/m³ to maximum 24-hour PM₁₀ levels, which is not in itself significant, however when combined with very high background data, cumulative levels will be in exceedance of the project specific criterion at all of the nearest sensitive receivers. This is due to the background PM₁₀ level used in the modelling (50.7 µg/m³) being already above this criterion (50 µg/m³). Current air quality management and dust mitigation practices in place at Myuna Colliery represent best practice mitigation measures and will be continued for the proposed Project. These mitigation measures include:

- Sealed hardstand areas including roads;
- Sweeping of all hard stand and sealed roads by a vacuum sweeper truck on a fortnightly basis;
- Sweeping of hard stand areas with an onsite bobcat with broom attachment, employed as necessary;
- Enclosure of the coal crushers and coal transfer points;
- Dampening down of operational and hardstand areas by the use of a water cart as required. Sprinklers are used for dust suppression when coal is stockpiled; and
- Enclosure and weekly wash down of all site conveyors to prevent aeration.

A complaints hotline is also maintained for the Colliery. Any complaints received are recorded and responded to in accordance with the procedures set out in the existing dust management plan.

With the exception of the 24-hour maximum PM₁₀ levels, the proposed Project will comply with project criterion at all nearby receptors. The proposed Project will not have a significant impact on the existing cumulative ambient air quality of the local area or surrounding region.

Centennial Myuna has an established depositional dust monitoring network around the Myuna Colliery which will continue to be monitored throughout the ongoing operations of the Myuna Colliery

The Office of Environment and Heritage as part of modernisation of monitoring recommends that new approvals replace ambient monitoring conducted with a requirement to monitor under AM19, this in effect replaces Hi-Volume Air Samplers with TEOM's for ambient PM₁₀ monitoring.

Given the existing management regime at Myuna Colliery and limited history of complaints regarding air quality, continued implementation of the Myuna Colliery Dust Management Plan is considered adequate to manage any residual consequences to air quality as a result of the proposed Project.

5.8 Aboriginal Heritage

The Office of Environment and Heritage note in their submission the absence of consultation evidence following the additional field assessment conducted on 11 February 2011. The absence of comments from the registered Aboriginal stakeholders regarding the results the additional field assessment, details of the significance assessment of the additional Aboriginal sites identifies and comments of support or otherwise of the final management and mitigation options highlights the incomplete consultation process. The Office of Environment and Heritage recommended that the proponent seek the views or opinions of the local Aboriginal community regarding the nature and extent of the outstanding matters to complete the cultural heritage assessment process.

A Cultural Heritage Assessment for the proposed Project, which incorporated an assessment of Aboriginal heritage was prepared by RPS Australia East Pty Limited (RPS) and was discussed in section 10.8 and included in Appendix M of the Environmental Assessment.

The Cultural Heritage Assessment identifies Aboriginal heritage sites in the area, the potential impacts of the proposed Project on these sites and recommends mitigation measures for their management. Aboriginal stakeholder consultation was undertaken in accordance with the Office of Environment and Heritage Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.

There were three registrations of interest from within the Aboriginal community arising from the consultation process: ADTOAC, ATOAC and Bahtabah Local Aboriginal Land Council. Consultation with these three parties included a presentation of the proposed Project and ongoing discussions regarding the cultural significance of the Project Application Area, while representatives from Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC) and the Awabakal Traditional Owners Aboriginal Corporation (ATOAC) attended the field survey undertaken for the Aboriginal heritage assessment.

The three registered parties were given the opportunity to review and provide comments on the draft Cultural Heritage Assessment Report and the proposed management of impacts as a result of the proposed Project on Aboriginal cultural heritage recorded within the Project Application Area.

Further details regarding the specific dates and avenues of consultation undertaken for the Aboriginal heritage assessment are provided in Table 1-1 of Appendix M within the Environmental Assessment.

Initial field surveys were undertaken by RPS on 22, 24 and 28 June 2010, The June survey was attended by two Aboriginal community members, Shane Frost of ADTOAC and Kerrie Brauer of ATOAC. Following the field surveys, a copy of the draft Cultural Heritage Impact Assessment report was provided to the registered Aboriginal stakeholders for comment.

As a result of feedback received in submissions from the registered Aboriginal stakeholders on the draft Cultural Heritage Impact Assessment, it was identified that there were concerns regarding the time allocated for the field surveys to be undertaken. As a result, the registered Aboriginal stakeholders were invited to attend an additional day of field surveys on 11 February 2011.

Although no direct feedback from the Aboriginal stakeholders following the final day of field work was requested, there were a number of ongoing discussions with the registered Aboriginal Stakeholders regarding the cultural significance of the Project Application Area in accordance with the Office of Environment and Heritage Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. As such the consultation process required to support the Environmental Assessment is complete and no further evidence of consultation is required. Centennial Myuna has and will continue to consult and engage with the local Aboriginal community on Aboriginal heritage matters associated with the current and proposed operations of the Myuna Colliery. This will be specifically undertaken through the commitment by Centennial Myuna in the Environmental Assessment to develop an Aboriginal Cultural Heritage Management Plan (ACHMP). The ACHMP will be developed for the identified Aboriginal heritage items within the Project Application Area and include 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 Application Area;
- Identification of roles and responsibilities (Centennial, Aboriginal stakeholders, heritage consultant); and
- Strategies for:

- Management of identified Aboriginal heritage sites;
- Review the management of Aboriginal heritage sites, should subsidence levels at existing monitoring points exceed 20 mm on land areas; and
- Management of additional sites, if identified.

Centennial Myuna has committed in the Environmental Assessment to develop the ACHMP in consultation with the relevant Aboriginal stakeholders to ensure that Aboriginal cultural values are adequately addressed.

Centennial Myuna is advised to promptly complete an Office of Environment and Heritage site recording card for each site and submit to the Office of Environment and Heritage for registration in Aboriginal Heritage Impact Management System.

The field surveys undertaken for the proposed Project recorded six new sites (RPS MB 1; EPS BH 1; RPS PW 2; RPS MP 1; RPS MP 2; and RPS MP 3) and two previously recorded sites (AHIMS #45-7-0186 and AHIMS # 45-7-0187) which were noted as having additional material required to be included on the Point Wolstoncroft 2 AHIMS record. The Office of Environment and Heritage submission notes that a search of the Aboriginal Heritage Information Management System (AHIMS) revealed that the Aboriginal sites for 'RPS MP2' and 'RPS MP3' have not been registered with the Office of Environment and Heritage. The Site Cards for 'RPS MP2' and 'RPS MP3' were submitted via email to Eva Day at DECCW on 6 April 2011 by RPS.

5.9 European Heritage

The Cultural Heritage Assessment does not adequately address the impacts the proposed Project may have on Non-Aboriginal heritage items. RPS did not include an assessment of significance for the rail line, which is associated intimately with a state significant item. This needs to be amended with an assessment of significance and any appropriate mitigation measures identified. There has been no attempt to assess whether the proposed Project will have any impact on the State Heritage Listed Wangi Power Station situated adjacent to the Project Area.

A Cultural Heritage Assessment for the proposed Project, which incorporated an assessment of European heritage was prepared by RPS Australia East Pty Limited (RPS) and was discussed in section 10.9 and included in Appendix M of the Environmental Assessment. The European heritage assessment involved a review of existing research, databases and survey results along with Project-specific field surveys and consultation with local heritage groups. Specifically, the assessment included:

- Desktop review of literature and historical records (including the *City of Lake Macquarie Heritage Study* (1993));
- Search of relevant databases including:
 - NSW Heritage Office;
 - Lake Macquarie City Council LEP 2004 and Draft LEP 2011; and
 - Wyong Shire LEP 1991.
- Consultation with local heritage groups and local Councils; and
- A field survey of the accessible landform types across the two separate and distinct sections of the Project Application Area: those bounded by Lake Macquarie (Myuna Bay, Buttaba Bay, Point Wolstoncroft) and those areas not immediately bounded by the Lake (Buttaba Hills, Morisset Peninsula).

In the submission by the Office of Environment and Heritage - Heritage Branch, concerns were raised that the Cultural Heritage Assessment did not adequately address the impacts the Project may have on Non-Aboriginal heritage. The Office of Environment and Heritage recommended that further Heritage assessment be undertaken to ensure that all potential non-Aboriginal heritage items and impacts have been assessed and mitigation strategies are in place. In particular concerns were raised regarding the Wangi Rail Line and the Wangi Power Station site.

The Wangi Rail Line mentioned in the correspondence by the Office of Environment and Heritage is located in mining Zone A, which is to have a subsidence level of not greater than 20 millimetres. The Wangi Rail Line has not had impact mitigation strategies developed, as RPS is confident that it is under no threat of impact from the Project either directly or indirectly. Subsidence levels of less than 20 millimetres will cause no impact to either

the remnant rail line material or the earth embankment and remaining gravel ballast sporadically located in a small part of the Project Area.

In relation to the State listed Wangi Power Station, it is entirely outside of the project area and entirely outside the subsidence angle of draw for the Project and as such there will be no impact to it from the proposed Project.

A pedestrian field survey of the project area provided the opportunity for the RPS archaeologist to identify any non-Aboriginal heritage items that may exist. All survey units were physically checked as part of the pedestrian field survey and where items of interest were encountered they were recorded for inclusion as presented in the original report.

5.10 Water Management

The proponent proposes to combine Licence Discharge Point (LDP) 1 and LDP 2 to become LDP B. The Office of Environment and Heritage has no objections to the merger of these two discharge points. The current discharge limit for LDP 1 is 12ML/day, and LDP 2 is 1ML/day therefore this combined volumetric discharge limit for LDP1 is revised to reflect the commitments in the EA to 8.6ML/Day.

Within the Statement of Commitments of the Environmental Assessment Myuna Colliery has included the action to submit a variation to EPL366 to the Office of Environment and Heritage to:

- Combine licensed discharge points LDP001 & LDP002 into a single licensed discharge point, LDPB, 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 80 millimetres in the 24 hours.
- Enable volumetric exceedances during rainfall events greater than:
 - 15 millimetres in the preceding 24 hours at LDP B.

As discussed in the Office of Environment and Heritage submission, they have no objections to the merger of the two discharge points and the licensing of LDP A.

The Office of Environment and Heritage has however stated that the discharge limit for the proposed LDP B be revised to 8.6 ML/day. The proposed Project will result in an increase in discharges through LDPB to an **average of 8.6 ML/day** and the Water Assessment concluded that operational requirements will vary over time, with variability similar to that experienced under existing conditions. The maximum daily discharge from Myuna Colliery through LDP B would remain 13 ML/day which is consistent with the current volumetric discharge limits on EPL 366.

The Environmental Assessment assessed the potential impacts of a daily discharge of up to 13 ML on Wangi Creek. Whilst the Environmental Assessment identified that there were no impacts currently or proposed from 13 ML/day discharge, Centennial Myuna has committed to monitoring the hydrological and geomorphic status of Wangi Creek to monitor potential impacts from ongoing discharge to this watercourse. Should hydrological and geomorphic impacts occur, an assessment of riparian vegetation condition and potential impacts associated with the changes to hydrology and geomorphology would be undertaken. This approach will ensure that riparian corridors, lacustrine habitats, coastal floodplains and estuarine environments are not adversely impacted by the proposal.

The NSW Office of Water (NOW) recommends that the Water Management Plan be updated based upon any updates to the site water balance and trigger levels and is submitted to NOW for review within 6 months of project approval.

Myuna Colliery has committed to updating the Water Management Plan to include the recommendations detailed within the Water Management Assessment in Section 10.2 of the Environmental Assessment within 6 months of Project Approval.

5.11 Rehabilitation and Mine Closure

The Environmental Assessment does not provide sufficient detail on rehabilitation, mitigation works and mine closure to allow the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) to adequately assess the proposal.

Myuna Colliery has committed to the development and implementation of a Rehabilitation and Environmental Management Plan (REMP) within 5 years of the completion of mining. In the absence of a Lake Macquarie Strategic Land Use Strategy, it is not possible at this time to determine an appropriate post-mining land use more than 20 years into the future with a clear set of rehabilitation criteria. Future land use would need to take into account market conditions, strategic planning frameworks as well as any changes to surrounding land use. Final land uses would be considered as part of the development of the REMP within 5 year of mine closure.

Section 10.12.1 of the Environmental Assessment includes a commitment to seal underground entries and boreholes in accordance with relevant government criteria at the time of decommissioning. Centennial Myuna will commit to addressing matters of linking the final landform with pre-existing land use, options of restoring and enhancing the natural ecology of the area and establishing a clear set of rehabilitation completion criteria that includes short, medium and long-term ecological criteria in the development of the REMP. Section 10.12.1 of the Environmental Assessment also identified that the current Mine Operations Plan (MOP) includes a conceptual final land use plan for the surface facilities area.

5.12 Threatened Species

Concerns over the intensity and timing of biodiversity surveys conducted on site for threatened species. The final Environmental Assessment did not contain information on the current condition of the Swamp Sclerophyll Forest on Coastal Floodplains EEC on Wangi Creek downstream of the Surface Facilities Area.

A Terrestrial Flora and Fauna Impact Assessment was prepared for the proposed Project by RPS Australia East Pty Limited (RPS). The results of the Terrestrial Flora and Fauna Impact Assessment were discussed in section 10.7 of the EA with the complete assessment report provided in Appendix L of the Environmental Assessment.

The proposed Project will involve limited land surface disturbance, will utilise the existing Surface Facilities Area, will involve minor clearing of native vegetation, and likely result in negligible levels of surface subsidence of land (less than 20 millimetres). Given the likely minimal extent of surface disturbance, a desktop assessment of the potential terrestrial ecological impacts of the proposed Project was carried out as it was determined that a field survey of the entire Project Application Area was not required.

This desktop assessment approach is supported by the letter from DECCW which accompanied the DGR's issued for the proposed Project, which stated:

"DECCW is of the opinion that if the predicted subsidence levels can be shown not to adversely impact on terrestrial threatened species, populations, ecological communities and their habitat then no further assessment would be required."

There is a potential for an increase in the average daily discharges (to a predicted rate of 8.6 ML/Day after 21 years) however the maximum discharge will remain constant in accordance with the limits nominated in EPL 366 (GHD 2010). The increase in discharge is not expected to result in any adverse impacts upon the EEC known as Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (SSFCE).

Monitoring of the hydrological and geomorphic status of Wangi Creek will be undertaken, to identify potential impacts to this watercourse. Should hydrological and geomorphic impacts be identified during the course of monitoring, an assessment of riparian vegetation condition and potential impacts associated with changes to hydrology and geomorphology would be undertaken. This approach will ensure that riparian corridors, lacustrine habitats, coastal floodplains and estuarine environments are not adversely impacted by the proposal and any associated increase in mine water discharge.

5.13 Social Impacts

The Social Assessments does not take into consideration the increased impact of subsidence on low lying land fringing Lake Macquarie. Any subsidence beyond the Zone A levels will still negatively impact the value of this low lying land.

Section 10.5 of the Environmental Assessment included a summary of the potential social impacts associated with the proposed Project. Land subsidence impacts as a result of underground mining were assessed as a negative impact and unlikely to occur. The Project Application Area is within a Mine Subsidence District for which Myuna Colliery pays levies under the Mine Subsidence Compensation Act. The proposed project will restrict subsidence of land areas within these subsidence districts to less than 20 millimetres, and as such potential negative impacts on surface improvements (buildings, infrastructure, roads etc) will be minimal.

Centennial Myuna has been operating the Myuna Colliery for over 28 years. A review of median house prices over the last 10 years in the suburb of Wangi Wangi, located adjacent to the Myuna Colliery Surface Facilities Area, indicates an increase in median property values by over 100% (www.myrp.com.au). This trend is consistent with median house prices in Lake Macquarie over the same period. This trend indicates that property values are determined by supply and demand rather than influenced by mining activities. As such the proposed Project is unlikely to have a negative impact on property values within the Project Area.

5.14 Consultation

Centennial Myuna have had minimal success notifying Wangi residents of the impending development application.

Myuna Colliery has kept the local community informed of the proposed Project through the distribution of project information in the local Lakes Mail newspaper (July 2010) and the development and distribution of a Project Information flyer to local businesses, members of the community, local Councillors and Members of Parliament. In addition, the Project information flyer was made publicly available on the Centennial Coal website. The submission of the application by Centennial Myuna for the proposed Project to the Department of Planning and Infrastructure was publicised in the Lakes Mail and the Land newspapers (1 July 2010) in accordance with the requirements of the Environmental Planning and Assessment Regulations 2000. The Environmental Assessment was made publically available on Centennial Coal's website. A project information letter was distributed to the local community prior to the lodgement of the Environmental Assessment to ensure the community were aware of the Environmental Assessment, provide information on how to access the document and make the community aware of the process to be followed if they wish to make a submission to the Department of Planning and Infrastructure regarding the proposed Project. The letter was distributed to the following suburbs: Arcadia Vale, Wangi Wangi, Buttaba, Fishing Point, Balmoral, Balcolyn, Brightwaters, Mirrabooka, Yarrowonga Park and Silverwater.

5.15 Sea Level Rise

Consideration of the NSW Government Sea Level Rise Policy Statement has not been addressed.

The NSW Government Sea Level Rise Policy has been considered in Section 7.3.6 of the Environmental Assessment. The NSW Sea Level Rise Policy Statement (OEH, 2009) (The Statement) outlines the Government's objectives and commitments with regard to sea level rise adaptation. The Statement discusses the impacts of sea level rise as well as identifies objectives and benchmarks to support communities and local councils to adapt to sea level rise in a way that minimises the resulting social disruption, economic costs and environmental impacts.

To assist in meeting the objectives of The Statement, the Government commits to supporting local councils and the community in adapting to sea level rise by:

- Promoting an adaptive risk-based approach to managing the impacts of sea level rise;
- Providing guidance to local councils to support their sea level rise adaptation planning;
- Encouraging appropriate development on land projected to be at risk from sea level rise;
- Continuing to provide emergency management support to coastal communities during times of floods and storms; and
- Continuing to provide up-to-date information to the public about sea level rise and its impacts.

The Environmental Assessment should address cumulative impacts of sea level rise as an external impact in combination with the impacts of the mine. The significance of sea level should be considered in terms of impacts on aquatic ecology.

Sea level rise along the NSW coast is predicted to rise 40 centimetres relative to 1990 mean sea levels by 2050 and 90 centimetres by 2100. The environment of Lake Macquarie would be expected to undergo changes of varying magnitudes over this period including to chemical composition, abundance and distribution of aquatic species, and relative lake depth. In addition to these natural changes, cumulative impacts may be expected with other developments that impact on the lake including residential, commercial and industrial developments.

Myuna Colliery is seeking project approval for an additional 21 years of mine life - to 2032. The Environmental Assessment includes a comprehensive subsidence assessment which identifies that current and predicted

subsidence on land will be less than 20 millimetres, therefore it is unlikely that the project will impact on flood risk or coastal hazards.

The Environmental Assessment does not consider the combined effects of mine subsidence, predicted sea level rise and decreases in light attenuation on benthic ecology.

Centennial Myuna have committed to establish a predictive model to assess the impacts of subsidence and reduced light attenuation on benthic communities within Lake Macquarie. The investigations would be undertaken prior to any secondary extraction being undertaken and would inform management actions that would avoid or minimise predicted impacts on benthic communities.

5.16 Soils

The Environmental Assessment fails to consider the potential impacts of soil contamination as a result of surface operations, the activation of acid sulphate soils due to lowering of the water table or surface cracking as a result of subsidence.

Section 2.3 of the Environmental Assessment describes the soil landscape of the Project Application Area. The soil landscapes within the Project Application Area are characterised by the Awaba, Doyalson and Wyong Soil landscapes. Awaba and Doyalson are erosional landscapes while Wyong comprises poorly drained deltaic floodplains and alluvial flats. Soils in the Wangi area are classified under the *Lake Macquarie to Gosford 1:100,000 Map Sheet* as part of the Awaba erosional landscapes. Soils in this area are typically shallow and gravelly, and are generally of moderate to low erodibility that vary in type from gravelly loam to well structured plastic clays. In contrast, the Wyong soil landscape, on Quaternary sediments, is situated on poorly drained floodplains with low slope. Low lying slightly elevated terraces are sometimes present. This soil type is commonly associated with drainage lines on the lake edge (Murphy 1993). Bore logs of the area were completed during exploration at Myuna Colliery. These concentrated mainly on underlying geology, but revealed that the parent material for surface sediments is a conglomerate.

The Environmental Assessment includes a comprehensive subsidence assessment which identifies that current and predicted subsidence on land will be less than 20 millimetres. As is noted in the Subsidence Assessment (Appendix C) 20 millimetres of subsidence is well within the usual shrink/swell range for the district. Delaney et al (2005) states:

“The observed reactive soil ground surface movements in open ground areas across the region range between 7 mm and 58 mm with an average of 29 mm...”

As a result, the proposed Project is not likely to impact soils or the water table.

5.17 Earthquakes

There is no reference in the Environmental Assessment to the possible impacts of seismic activity.

Although the Environmental Assessment did not include an assessment of the likelihood of the proposed Project increasing seismic activity, the proposed Project will not introduce a hazard of inducing seismic activity with the first workings layout being considered for Zone A. Within Zone A, the pillars are very large and the deformations that would be applied to the overburden strata are small. For the layouts being considered for Zone B, the key mine design consideration will be the prevention of water inflow to the mine. The mine design can proceed with confidence there are several conglomerate units in the overburden which are adequately laterally continuous. Water inflows to the mine will be prevented by ensuring that the conglomerate units span across the extraction panels. The conglomerate units will deflect (and cause subsidence) but they will not fracture. Without fracturing, not only will there be no water inflows but also there will be no contribution from the mining activity to seismic events.

5.18 Foreign Ownership

Centennial Coal has been purchased by a foreign company. There is now an increased likelihood that more Myuna coal will be exported; if so there will be more road transport from the Myuna Colliery.

In 2010, Centennial Coal Company Limited (Centennial) was purchased by Banpu Minerals (Singapore) Pte Ltd. Centennial supplies and will continue to supply thermal and semi-soft coking coal to domestic and export markets. Currently, Centennial provides NSW with coal for approximately 47% of the state's coal fired electricity.

The proposed project is seeking approval to produce, handle and distribute to Eraring Power Station, up to 2 Mtpa using existing infrastructure. Myuna Colliery has and will continue to supply coal to the Eraring Power station using the Eraring Energy owned enclosed overland conveyor. Myuna Colliery would require an additional approval if it were to transport coal into the export market.

5.19 Plans and Policies

The Environmental Assessment did not consider:

- **State Environmental Planning Policy Clause 12 - Concerns with regards to Amendment No 33 of Lake Macquarie LEP 2004;**
- **Wyong Development Control Plan 05 Ch 13 – Interim Conservation Area; and**
- **Draft North Wyong Structure Plan.**

Section 2.4 of the Myuna Colliery Extension of Mining Environmental Assessment notes that a rezoning application for the Wangi Power Station at 80 Donnelly Road Arcadia Vale, was approved on 14 July 2010. The site has been rezoned as Zone B4 Mixed Use Zone, which permits a range of development including residential and mixed use. Schedule 9 of Lake Macquarie LEP 2004 requires that any proposed residential development of Wangi Power Station site incorporates all practical mitigation measures for the management of noise, visual and odour impacts from the adjoining mining and petroleum production operation. At the time, no proposal to develop the land is before Lake Macquarie City Council. As such, future development on the site would be required to take into consideration the operations at Myuna Colliery.

The Wyong Development Control Plan (DCP) 2005 Chapter 13 – Interim Conservation Areas, has been addressed in Section 7.5.4 of the Environmental Assessment. With the exception of Point Wolstoncroft which has been assessed for subsidence impacts to flora, fauna and heritage; no other areas of conservation within this Plan are in the Project Application Area. An assessment of terrestrial ecology impacts within the Project Application Area, including Point Wolstoncroft has been undertaken as part of the Environmental Assessment (refer to Section 10.7 and Appendix L) and has determined that potential impacts to terrestrial ecology are negligible (refer to Section 10.7). The assessment in Appendix L of the Environmental Assessment has addressed the environmental planning criteria listed in Part 2 of the DCP, including an assessment of threatened species, communities, populations or critical habitat under the Threatened Species Conservation Act 1995 and an assessment of the significance of those species or habitat that have the potential to be impacted.

The Draft Wyong Structure Plan was released by the Department of Planning for public comment on the 10 November 2010 and has been addressed in Section 7.5.5 of the Environmental Assessment. The Draft North Wyong Shire Structure Plan (Department of Planning, 2010) (Draft Structure Plan) is a high-level strategic planning framework developed to assist in the implementation of the 2008 Central Coast Regional Strategy (Department of Planning and Infrastructure, 2008) (Regional Strategy) and to guide future local planning. The Regional Strategy identifies that the North Wyong area will accommodate the majority of the region's new Greenfield development to 2031. The Draft Structure Plan considers a staging and sequencing plan to inform planning and infrastructure investment, meet housing demands, infrastructure requirements, and current and potential future mining issues.

Point Wolstoncroft is the only portion of the Project Application Area located within the Wyong LGA, and falls within the northern boundary of the Draft Structure Plan area. Point Wolstoncroft is part of the Lake Macquarie State Conservation Area, as discussed in Section 2.2.1. The Draft Structure Plan aims to ensure that planning for biodiversity at local levels improves or maintains existing areas of high biodiversity value to address biodiversity loss. The Draft Structure Plan recognises Point Wolstoncroft as part of a State Conservation Area, and there is no future residential or employment areas proposed in the immediate vicinity under the Draft Structure Plan.

While a portion of the Project Application Area is located within the Draft Structure Plan area, the proposed Project would not directly impact proposed future development areas or compromise the preservation of biodiversity values designated under this plan.

5.20 Eraring Ash Dam

The Eraring Ash Dam is a significant dam that forms part of the ash disposal system of Eraring power Station and has a Significant Hazard Rating as a consequence of the appreciable economic and environmental damage failure of the dam would cause.

A portion of the Project Application Area falls within the Notification Area for the Eraring Ash Dam. CMPL will seek approval from the Dams Safety Committee prior to any mining within the Eraring Ash Dam Notification Area in accordance with current lease conditions.

The mine design will address the various mine constraints which are specified in mining leases, including the High Water Level Subsidence Control Zone (HWLSCZ); the Notification Area of Eraring Ash Dam; 40 metres of solid rock head; and the coal pillar factor of safety.

6 REVISED STATEMENT OF COMMITMENTS

A revised Statement of commitments for the Construction and Operation of the Myuna Colliery if Project Approval were to be granted has been provided in Section 6.1 and Section 6.2 respectively.

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: <ul style="list-style-type: none"> • 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	
<p>Items and areas of Aboriginal sensitivity are not disturbed as a result of the proposed Project, where possible.</p>	<p>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).</p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ○ 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. <p>The Myuna Colliery ACHMP will be developed in consultation with the relevant Aboriginal stakeholders and will adequately address Aboriginal cultural values.</p>
Aquatic Ecology	
<p>Assess potential impacts from subsidence on benthic communities prior to secondary extraction.</p>	<p>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:</p> <ol style="list-style-type: none"> 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

	<p>benthic communities, including the proportion of the Lake bed likely to be affected; and</p> <p>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.</p>
<p>Life of Mine Rehabilitation</p>	
<p>Sufficient planning is undertaken for end of life of mine and rehabilitation.</p>	<p>11. The proponent will develop and implement a Rehabilitation and Environmental Management Plan within 5 years of completion of mining.</p>

Appendix 1 - Myuna Colliery Mine Design Criteria and Mining Methods for Seams

Design Criteria and Mining Methods for Seams

Seam	Location (at Surface level)	Mining System (at seam level)	Design Criteria
Walarah	<i>Zone A+Transition area</i>	<i>First Workings ONLY</i>	(1) (2)
	<i>Zone B</i>		
Great Northern	<i>Zone A+Transition area</i>	<i>First Workings ONLY</i>	(1) (2)
	<i>Zone B</i>	<i>First Workings and Partial Extraction (typically Non Caving)</i>	(1) (2) (3)
Fassifern	<i>Zone A+Transition area</i>	<i>First Workings ONLY</i>	(1) (2)
	<i>Zone B</i>	<i>First Workings and Partial Extraction</i>	(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 1/10th 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.

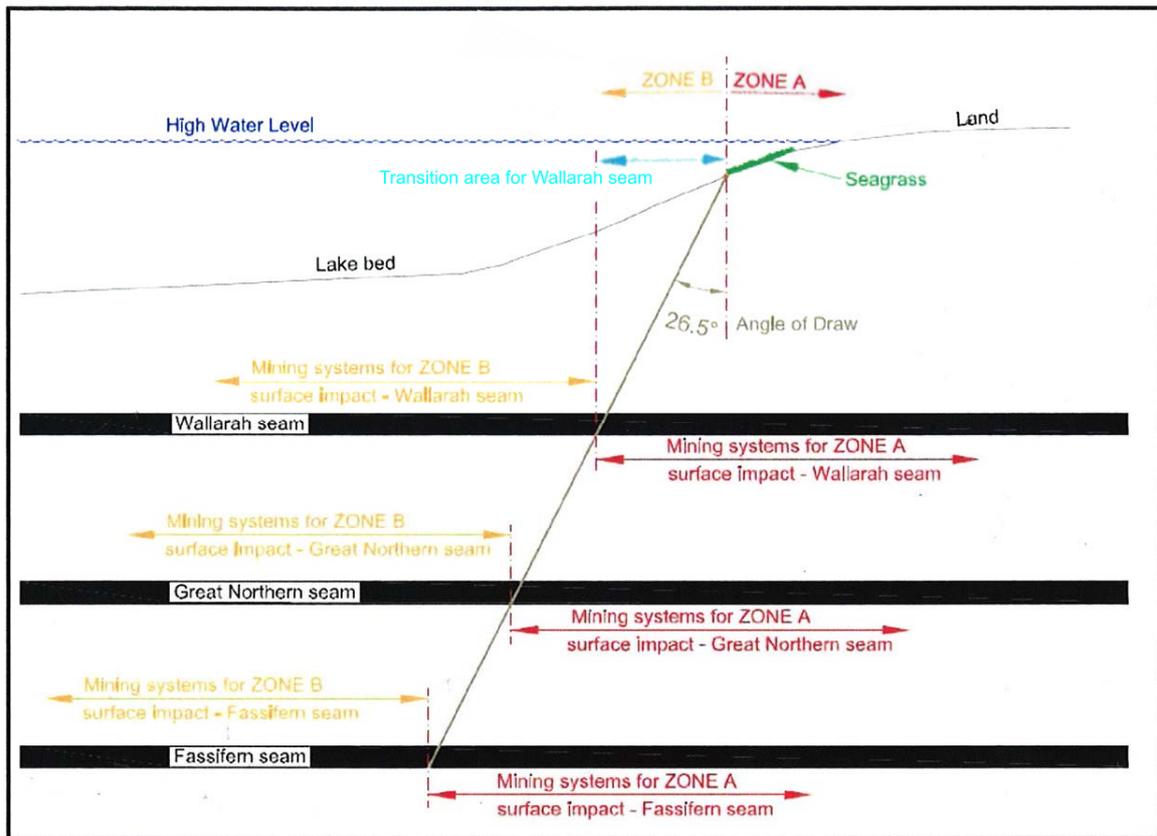


Figure 1

Definition:

Zone A: Long term stable mining systems generating up to 20mm surface subsidence on sensitive surface features including land and seagrass beds.

Zone B: Mining systems generating up to 650mm surface subsidence (under Lake Macquarie).

Transition area: (at surface level): is area from the Zone A/B boundary to a line drawn vertically upward from the relevant seam at a point which an angle of draw of 26.5 degrees intersects the seam. In the transition area subsidence effect will gradually increase from the Zone A/B boundary (minimal - 20mm) to a greater amount (dependent on extraction method).

Partial Extraction (Non-Caving): The concept behind non-caving is that when pillars are partially extracted the overburden material is competent enough to span across this void and does not generate a connecting fracture between multi-seam workings. The remaining load bearing pillar and surrounding strata deforms in an elastic manner resulting in minimal subsidence.

Outcomes:

Reserves are safely and economically mined in accordance with approval conditions and within predicted subsidence parameters for Zones A and B.

Monitoring Process:

Surveyed and monitored subsidence lines in designated locations across the surface. Installed prior to commencing extraction.

Contingency:

Flexibility of Continuous Miner Operation. Mining is not constrained to an area where unfavorable geological or mining conditions are encountered.