

# **Appendix I**

## **Myuna Colliery Biodiversity Management Plan**

## DOCUMENT CONTROL

| DOCUMENT CONTROL            |                 |   |
|-----------------------------|-----------------|---|
| <b>DOCUMENT<br/>DETAILS</b> | Name:           | Northern Region Biodiversity Management Plan –<br>Appendix I Myuna Colliery |
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# 1 Overview of Operations

Myuna Colliery (Myuna) is an existing underground bord and pillar coal mining operation producing thermal coal that is supplied to domestic markets. It is located approximately 25 kilometres south-west of Newcastle in the Lake Macquarie and Wyong Local Government Areas (LGA) in New South Wales. Myuna is 100 percent owned and operated by Centennial Myuna Pty. Limited (Centennial Myuna), a subsidiary of Centennial Coal Company Limited. Centennial Coal Company Limited is a wholly owned subsidiary of Banpu Public Company Limited.

Myuna operates under Project Approval (PA) 10\_0080 which was granted by the then Minister of Planning and Infrastructure on 18 January 2012. A modification to PA10\_0080 was approved on 1<sup>st</sup> February 2015 which increased Myuna's production limit to 3 Mtpa.

Myuna includes the following infrastructure:

- Mine infrastructure;
- Coal handling plant including breaker and crusher groups, feeders and coal storage bins, and surface conveyor systems;
- Workshop and administration infrastructure;
- Pollution control infrastructure;
- Other non-mining infrastructure such as potable water supplies, overhead transmission lines, Energy Australia 33kV substation, telecommunications and Hunter Water sewage system;
- Emergency stockpile area;
- Down cast shaft area;
- Lower field; and
- Water management area.

## 1.1 Structure of Myuna Biodiversity Management Plan

This Myuna Biodiversity Management Plan (BMP) is an Appendix to the Northern Region BMP Northern Region BMP. This BMP has been prepared by RPS Australia East. The Management Plan includes the following Sections:

- Biodiversity Consent Conditions

The conditions of consent are reproduced and identified where in the Myuna BMP they are addressed.

- Baseline Data

A description of baseline data for terrestrial ecology is presented including ecological communities, threatened ecological communities, habitat values, groundwater dependent ecosystems, flora, threatened flora and threatened fauna.

- Management

Identifies management types for tracts of land within the mining lease and the biodiversity outcomes designated for the following: operational areas, native vegetation, areas of biodiversity significance. Actions are described for each management area, including timing and frequency.

- Site Specific Management Measures

Description of management measures identified within the consent not required under this management plan and where the requirements are addressed.

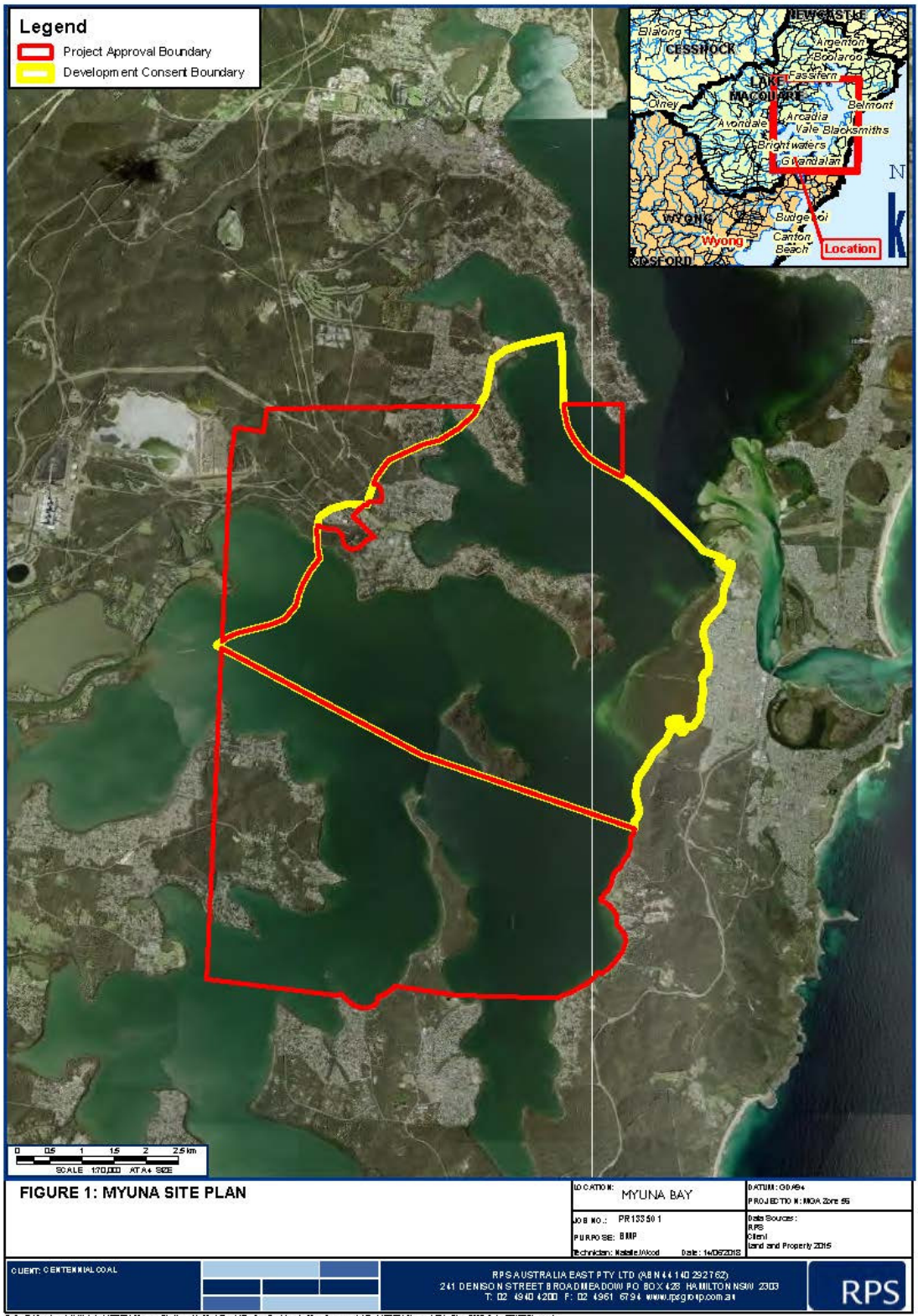
## 1.2 Biodiversity Consent Conditions

The relevant Project Development Consent conditions for PA 10\_0080 are reproduced below in Table 1.

**Table 1 Myuna Project Approval (10\_0080)**

| Condition Reference          |        | Consent Condition   | Addressed in Biodiversity Management Plan  |
|------------------------------|--------|---|--|
| Biodiversity Management Plan |        |   |  |
| Schedule 3<br>Condition 28   | 28     | The proponent shall prepare and implement a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:  |  |
|                              | 28 (a) | Be submitted to the Secretary within 7 months of the date of this approval;   | This site specific appendix is a revision to the previously approved Myuna Biodiversity Management Plan being incorporated in the Northern Region Biodiversity Management Plan |
|                              | 28 (b) | Be prepared by a suitable qualified ecologist approved by the Secretary;  | Request was made for endorsement of RPS Australia East to DPE on 31 July 2018. RPS Australia East were previously endorsed by DPE to prepare the Myuna BMP on 20 April 2012    |
|                              | 28 (c) | Have a particular focus on measures that would be implemented over the life of the mine to protect and enhance the <i>Swamp Sclerophyll Forest on Coastal Floodplains</i> endangered ecological community near Wangi Creek; and   | Section 3.1.1 of this Appendix   |
|                              | 28 (d) | Include 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 <i>Swamp Sclerophyll Forest on Coastal Floodplains</i> endangered ecological community near Wangi Creek) are properly managed, including procedures for: <ul style="list-style-type: none"> <li>• Weed management (both control and suppression);</li> <li>• Protection and enhancement of native vegetation and habitat;</li> <li>• Feral animal control;</li> </ul> | Northern Region BMP Section 4.3<br><br>Northern Region BMP Section 4.4<br>Section 3.2 of this BMP<br>Northern Region BMP Section 4.5<br>Northern Region BMP Section            |

| Condition Reference       |      | Consent Condition   | Addressed in Biodiversity Management Plan                           |
|---------------------------|------|---|---|
|                           |      | <ul style="list-style-type: none"> <li>• Fire management (including asset protection zones); and</li> <li>• Management of public access.</li> </ul>   | 4.9<br>Northern Region BMP Section 4.10                             |
| Schedule 5<br>Condition 2 | 2    | The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:   |   |
|                           | 2(a) | Detailed baseline data;   | Section 2 of this BMP   |
|                           | 2(b) | A description of: <ul style="list-style-type: none"> <li>• The relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>• Any relevant limits or performance measures/criteria;</li> <li>• 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;</li> </ul> | This table  |
|                           | 2(c) | A description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performances measures/criteria;  | Section 4.1 of this BMP   |
|                           | 2(d) | A program to monitor and report on the: <ul style="list-style-type: none"> <li>• Impacts and environmental performance of the project;</li> <li>• Effectiveness of any management measures (see c above);</li> </ul>  | Northern Region BMP Section 5.4                                     |
|                           | 2(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;   | Section 4.11 of this BMP  |
|                           | 2(f) | A program to investigate and implement ways to improve the environmental performance of the project over time;  | Northern Region BMP Section 4.1                                     |
|                           | 2(g) | A protocol for managing and reporting any: <ul style="list-style-type: none"> <li>• Incidents;</li> <li>• Complaints;</li> <li>• Non-compliances with statutory requirements; and</li> <li>• Exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul>  | Northern Region BMP Section 5.4                                     |
|                           | 2(h) | A protocol for periodic review of the plan.   | Section 3.5 of this BMP<br>Northern Region BMP Sections 6.3 and 6.4 |



Path: S:\02enterial\041 Jobs\133501 Myuna Biodiversity Mgt Plan\10 - Drafting\Wq\15 Map Documents\133501 Figure 1 BMP Plan BMP\_C\_A\*20150514.mxd

## 2 Baseline Data - Terrestrial Ecology

### 2.1 Habitat

Vegetation within Myuna is classified into four broad fauna habitat types including:

- Dry Sclerophyll Forest
- These habitat types are characterised by habitat features such as open or closed forests, hollow bearing trees, aquatic habitats, ground timber, flowering/fruited vegetation and vegetation structures for shelter or foraging (e.g. groundcover and leaf litter).
- Temperate Woodland
- Temperate woodlands are less resourceful in the shrub layer but provide grazing and basking opportunity for macropods. Grasses in the understorey provide foraging resources for seed eating birds, and foraging habitats for snakes and lizards.
- Swamp (Floodplain) Forest and woodland
- Swamp environments can be moist and wet under foot throughout the year, and are often very dense in the understorey creating suitable habitats for small mammals such as rats and Antechinus. Certain eucalypts, such as the Swamp Mahogany (*Eucalyptus robusta*) provides winter foraging resources for threatened species such as the Grey-headed Flying-fox (*Pteropus poliocephalus*).
- Cleared/disturbed areas
- Cleared/disturbed areas are typically limited in their resource availability but can be used for grazing by macropods, foraging by various seed eating birds that take advantage of the usually abundant exotic grass species and foraging by snakes.

### 2.2 Ecological Communities

Eight vegetation communities have been identified within Myuna. These are listed in Table 2 below and presented in Figure 2.

**Table 2 Ecological Communities at Myuna Mine**

| LHCCREMS Vegetation Map Unit Number (MU)               | Area (ha)     |
|--|---------------|
| MU 11: Coastal Sheltered Apple – Peppermint Forest     | 9.87          |
| MU 15: Coastal Foothills Spotted Gum – Ironbark Forest | 66.07         |
| MU 30: Coastal Plains Smooth-barked Apple Woodland     | 313.58        |
| MU 31: Coastal Plains Scribbly Gum Woodland            | 231.20        |
| MU 37: Swamp Mahogany – Paperbark Forest               | 5.53          |
| MU 38: Redgum Rough-barked Apple Forest                | 5.31          |
| MU 40: Swamp Oak Rushland Forest                       | 13.02         |
| MU 42: Riparian Melaleuca Swamp Woodland               | 23.03         |
| <b>Total</b>   | <b>667.61</b> |

Four vegetation types have been identified as commensurate with a listed endangered ecological community (EEC) at Myuna as listed in Table 3. The vegetation types are listed under the *Biodiversity*

*Conservation Act 2016* (BC Act) and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) are listed in Table 4.

**Table 3 Endangered Ecological Communities Myuna**

| LHCCREMS Vegetation Map Unit Number (MU) | Listed EEC (BC Act)   | Listed EEC (EPBC Act)   |
|--|---|---|
| MU 37: Swamp Mahogany – Paperbark Forest | Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions       | -   |
| MU 38: Redgum Rough barked Apple Forest  | River Flat Eucalypt Forest on the Coastal Floodplains of the NSW north Coast, Sydney Basin and South East Corner Bioregions | -   |
| MU 40: Swamp Oak Rushland Forest         | Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions EEC            | Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland EEC |
| MU 42: Riparian Melaleuca Swamp Woodland | Swamp Sclerophyll Forest of the Floodplains of the North Coast, Sydney Basin and Southeast Corner Bioregions EEC            | -   |

## 2.3 Groundwater Dependent Ecosystems

Four vegetation communities have been identified as all or in part to be commensurate with the definition of a Groundwater Dependent Ecosystem (GDE) at Myuna and are presented in Figure 2:

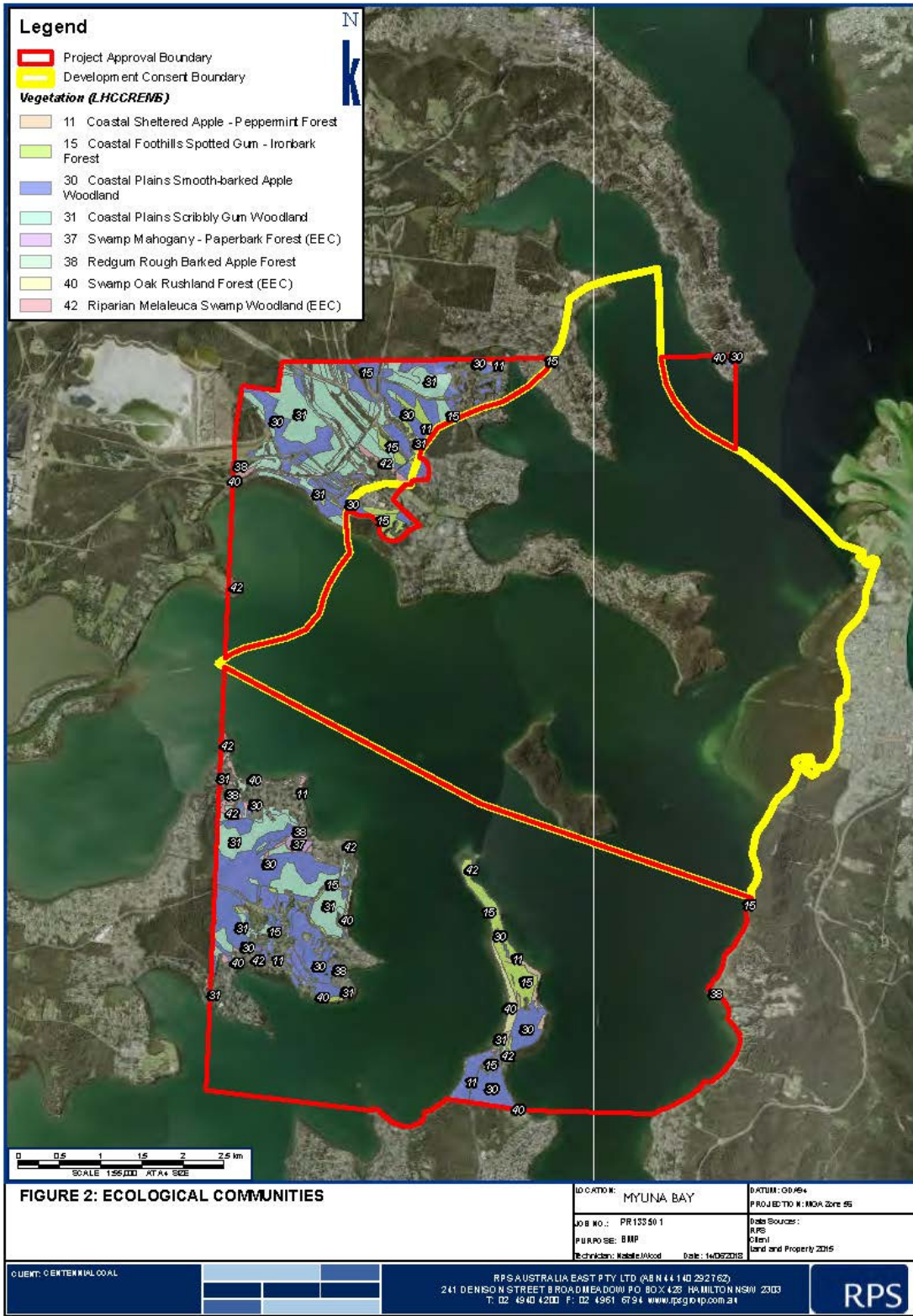
- MU 37: Swamp Mahogany – Paperbark Forest;
- MU 38: Redgum Rough Barked Apple Forest;
- MU 40: Swamp Oak Rushland Forest; and
- MU 42: Riparian Melaleuca Swamp Woodland.

## 2.4 Threatened Flora

No threatened flora species are currently known to be present at Myuna.

## 2.5 Threatened Fauna

No threatened fauna species are currently known to be present at Myuna.



## 3 Management

### 3.1 Management Areas

Management areas are situated within Centennial's area of management and are based on operational activities, vegetation type and proposed management objectives. Management areas are summarised below and are shown in Figure 3, with a description of the activities in the following sections and detailed management actions presented in Tables 4 to 6.

#### 3.1.1 Operational Areas

The objective of management within operational areas is to manage environmental values to maintain or improve environmental biodiversity values within the area. Operational areas include the Myuna Mine Surface Site. Management measures include:

- Bushfire management;
- Weed management;
- Erosion management;
- Surface water management; and
- Access management.

Once active operations in an area have ceased, rehabilitation measures can be implemented to restore the biodiversity values in the area as part of closure in accordance with the Mining Operations Plan Rehabilitation Management Plan.

#### 3.1.2 Native Vegetation

The objective of management within areas of native vegetation is to maintain or improve environmental values within the area. This applies to areas of native vegetation and habitat within Centennial Myuna owned lands that do not constitute areas of biodiversity significance. To enhance areas of existing remnant vegetation the following management measures are required:

- Weed management;
- Pest management;
- Salinity management;
- Erosion management;
- Bushfire management; and
- Access restrictions.

#### 3.1.3 Areas of Biodiversity Significance

This management area encompasses areas of biodiversity significance such as EECs and GDEs situated within Centennial Myuna owned lands, including:

Endangered Ecological Communities including:

- River Flat Eucalypt Forest on the Coastal Floodplains of the NSW north Coast, Sydney Basin and South East Corner Bioregions EEC;
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions EEC; and
- Swamp Sclerophyll Forest of the Floodplains of the North Coast, Sydney Basin and Southeast Corner Bioregions EEC.

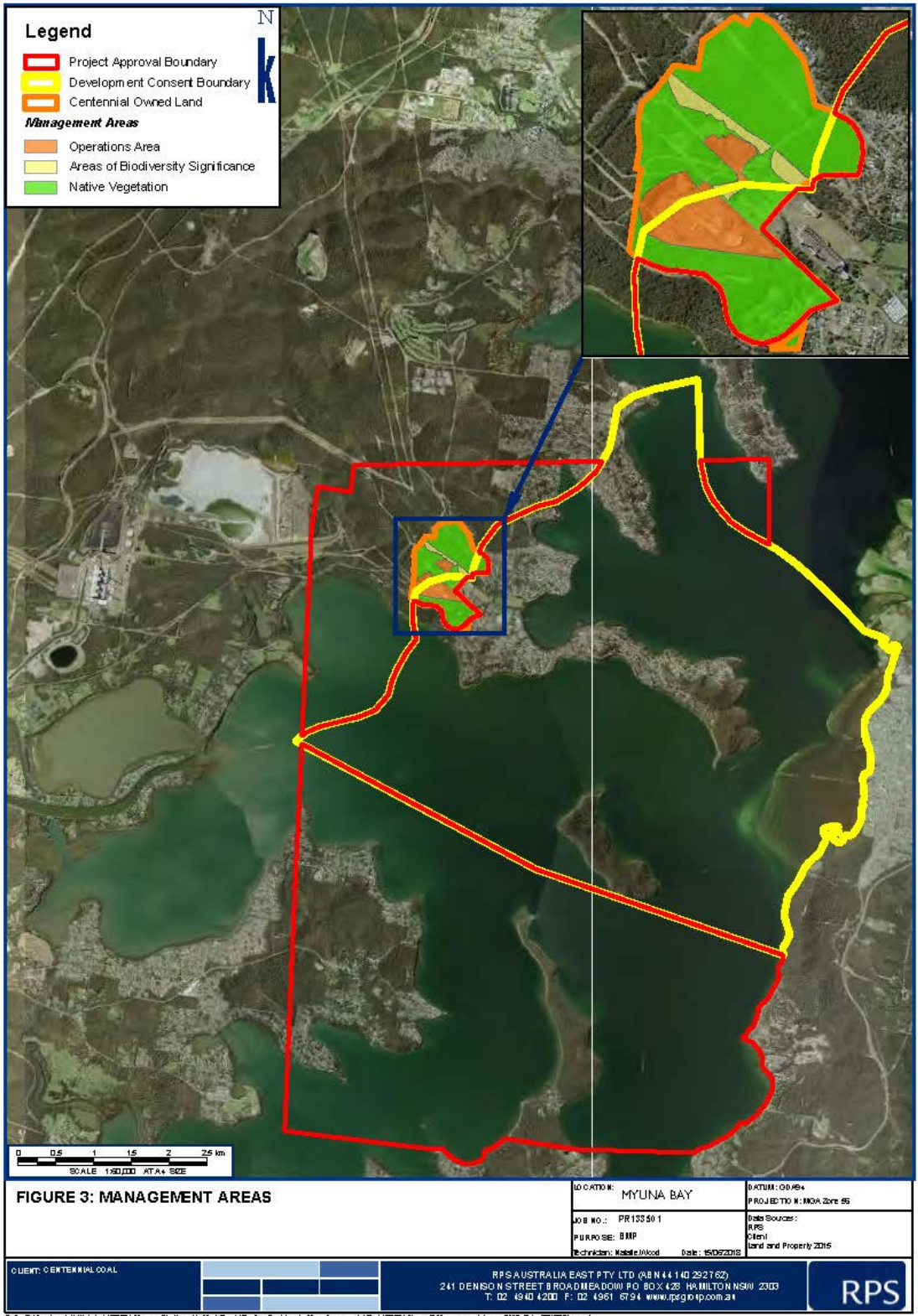
Groundwater Dependand Ecosystems including:

- MU 37: Swamp Mahogany – Paperbark Forest;
- MU 38: Redgum Rough Barked Apple Forest;
- MU 40: Swamp Oak Rushland Forest; and
- MU 42: Riparian Melaleuca Swamp Woodland.

The objective within areas of biodiversity significance is to undertake management as required at a minimum under the Project Approval and maintain or improve biodiversity values at these locations. To meet these objectives these areas will require the following management measures:

- Weed management;
- Bushfire management;
- Pest management; and
- Access management.

A specific monitoring program is has been developed and implemented for the Swamp Sclerophyll Forest EEC. Ecological monitoring is undertaken annually as per Section 3.3.3 of this Appendix, with recommendations for management actions arising from the monitoring implemented as appropriate (Table 6).



Path: S:\Centennial\Jobs\133501 Myuna Biodiversity Mgt\Part10 - Drafting\Wq\Map Documents\133501 Figure 3 Management Areas BMP EA\2016051.kml

### 3.2 Management Actions

Land management activities are presented in Tables 4-6 with identified management areas for Myuna in Figure 3. The land management activities will be implemented by the Site Environment and Community Coordinator and undertaken in consultation with, but not limited to, relevant specialists or contractors including; Bush Regenerators, Weed and Pest Management, qualified Ecologists, Local Land Services and the Rural Fire Service. Management actions outlined below incorporate short, medium and long term goals for the duration of each required measure.

The frequency for management activities identifies the time period for which activities will continue to be undertaken. Activities required for the period of the operation or in perpetuity are identified. Where future actions are dependent on the success of current activities a 3 year time period has been provided. This document will be reviewed annually for the Annual Review and three yearly to identify the success of measures implemented for the upcoming three year period, as identified in Section 5.4 of the Northern Region BMP.

**Table 4 Operational Areas Management Activities**

| Management Actions   | Timing                             | Frequency                                   |
|--|------------------------------------|---|
| Access management – maintenance of existing gates and signage in accordance with Section 4.10 Northern Region Biodiversity Management Plan | Complete                           | As required                                 |
| Bushfire Management - Maintenance of APZs- slashing  | Ongoing                            | Quarterly                                   |
| Erosion to be controlled in line with the site Erosion and Sediment Control Plan   | On an as required basis            | As required                                 |
| Surface water management in accordance with the Water Management Plan  | As per Myuna Water Management Plan | As per Myuna Water Management Plan          |
| Pre-clearance surveys in accordance with Section 4.3 of the Northern Region BMP  | Prior to vegetation removal        | Prior to all clearing activities commencing |

**Table 5 Native Vegetation Management Actions**

| Management Actions  | Timing                      | Frequency                   |
|---|-----------------------------|-----------------------------|
| Removal of weeds, particularly WoNS/ noxious weed infestations, identified through ongoing monitoring – Treatment in accordance with Section 4.4.2 of the Northern Region BMP | As per the Weed Action Plan | As per the Weed Action Plan |
| Pest management - Treatment in accordance with Section 4.5.2 of the Northern Region BMP   | On an as required basis     | On an as required basis     |
| Management of weeds - Treatment in accordance with Section 4.4.2 of the Northern Region BMP   | As per the Weed Action Plan | As per the Weed Action Plan |
| Bushfire Management - Review bushfire management plan and revise if necessary   | December 2018               | Annually                    |
| Erosion to be controlled in line with the site Erosion and Sediment Control Plan  | On an as required basis     | As required                 |
| Access management – maintenance of existing gates and signage in accordance with Section 4.10 of the Northern Region BMP  | Complete                    | As required                 |

**Table 6 Areas of Biodiversity Significance Management Actions**

| Management Actions  | Timing                      | Frequency   |
|---|-----------------------------|---|
| Removal of weeds, particularly WoNS/ noxious weed infestations, identified through ongoing monitoring – Treatment in accordance with Section 4.4.2 of the Northern Region BMP | As per the Weed Action Plan | As per the Weed Action Plan                                 |
| Monitoring of habitat health and vegetation condition at existing monitoring locations within the EEC/GDE as per Section 3.3 of this Appendix.                                | Spring                      | Annually  |
| Actions to implement recommendations of the above monitoring.   | Ongoing                     | Annually following recommendations within monitoring report |
| Bushfire Management - Review bushfire management plan and revise if necessary   | December 2018               | Annually  |

## **3.3 Site Specific Management Measures – Myuna**

### **3.3.1 Terrestrial Biodiversity Monitoring**

Biodiversity monitoring is undertaken for the MU 42 Riparian Melaleuca Swamp Woodland in accordance with the monitoring program in Section 3.3.3.

### **3.3.2 Bushfire Management Plan**

The Bushfire Management Plan shall be reviewed annually to ensure the recommended bushfire mitigation measures support the objectives of the BMP. The desired outcome of the Bushfire Management Plan is to implement and maintain a fire regime that suits both the natural fire frequency of the ecosystem and therefore encourages biodiversity (reflects the requirements of nationally threatened species), as well as protecting human life and assets.

The broad strategies to manage fire risk include:

- Eliminate the fire risk.
- Manage all fuel and infrastructure to reduce the rate of spread and intensity of fires including structural risks.
- Manage fire regimes to enhance areas of biodiversity significance and areas of native vegetation.
- Engineering controls to effectively contain fires.
- Administration and organisation.

### **3.3.3 Exploration and Surveys**

Rockhead is the term used for the thickness of bedrock beneath soil cover. Understanding the rock depth and thickness is critical to Centennial Myuna's ongoing management of the risk of inrush into its underlying mining operations. Catastrophic inrush of water is a specified principal hazard under relevant safety legislation. All mines are required to address this risk through a Principal Hazard Management Plan. Given Myuna's location this under the Lake Macquarie this issue has particular relevance. Myuna has a responsibility under the Work Health and Safety Act to ensure, as far as reasonably practicable to ensure the safety of its workers. A significant amount of work has already been completed at Myuna Colliery in an effort to manage risks associated with mining beneath tidal waters and foreshore areas. The current mine planning parameters allow for first workings only, with conservative design of pillars providing significant safety factors for long term stability. The continued application of these design parameters for mining under the lake (to the 40 m rock head cover line) has been the major control for managing the risk of potential inrush at the mine.

In order to determine rockhead depth and thickness, ongoing survey and exploration activities are required to be carried out. These activities are necessary to:

- Enable the coal resource to be defined with greater accuracy.
- Gather information to complete a safe mine design.

- Provide information to assist with future mine planning and design.
- Gather geotechnical information related to strata type, strength, stability and defects.
- Gather geological information related to the location and magnitude of geological structures.

The types of survey and exploration activities undertaken at Myuna include:

### **1. Airborne magnetic surveys**

Airborne magnetic surveys are used to collect information on the intensity of the magnetic field across the area of interest. This information is used to identify where intrusions may occur within the coal seam. An unmanned aerial vehicle, commonly referred to as a drone, is used to undertake these surveys. The drones are flown along survey lines at low altitudes (minimum 5 m above the water surface) and at low speeds (approximately 32 km/hr). The magnetic survey would provide airborne exploration without the need for disturbance activities, with staff operating the drone making use of existing publicly accessible areas to launch the equipment.

### **2. Shallow Marine Survey**

Shallow marine survey systems are used to determine physical properties of the sea floor and to image and characterise geological information a few metres below the sea floor. Specifically, this survey technique will be used by Centennial Myuna to provide a higher definition of rock head thickness above the coal seam and provide definition of the rock head features.

The shallow marine surveys are undertaken using a low impact survey method which uses a small boat towing survey equipment called a Sparker. Sound pulses bounce off the lake floor to help map the topography and composition of the lake floor. The acoustic energy is generated by a mechanical device meaning there is no explosive source used to generate energy. A Sparker converts electrical energy into acoustic energy via the creation of a plasma bubble and the consequent generation of an acoustic pulse. This technique is used worldwide.

In Lake Macquarie similar survey methods are regularly used to monitor how the changing lakebed impacts on boat navigation in Swansea Channel. It is regularly used in Newcastle and Sydney harbours to assess water depth for dredging. Similar technologies are also used by marine scientists in sensitive marine environments, such as the Great Barrier Reef, to develop maps used to model ocean currents, storm surge inundation and better understand ecosystem and biodiversity patterns on the seabed. These types of maps are widely used across all marine environments.

### **3. Rockhead drilling**

Completed using a combination of rotary drilling methods in soils using HWT and HQ drill casings, and NMLC coring methods in rock; with the target being 1 m length of rock (with drilling ranging in depths of 30 to 40 m). This type of drilling is used to determine rockhead thickness and calibrate the shallow marine survey results. The drill rig would be transported to the relevant drilling location via a 20 tonne Jack-up barge, which would be held in position using spuds/jack-foots up to 30 m long. Jacks simply give the barge stability in water. The area of the barge represents a works site as if it

were on land. The barge would remain on station (over borehole) each day / night and during weekends.

#### **4. Surface to Seam Drilling**

Completed using a combination of rotary drilling methods in soils using PW and HWT casing, and HQ coring methods in rock; with the target being Fassifern Seam, ranging in depths between 100 m and 170 m. This type of exploration is used to investigate coal quality. The drill rig would be transported to the relevant drilling location via a 20 tonne Jack-up barge, which would be held in position using spuds/jack-foots up to 30 m long. The barge would remain on station (over borehole) each day / night and during weekends.

##### **3.3.3.1 Summary of Potential Impacts**

###### **Soil Impacts**

The drilling programme is the only activity with the potential to impact estuarine sediments as a result of the anchoring of the barge and completion of drilling activities. Given the small diameter of the drill holes (approximately 100 mm), drilling would have a negligible impact on sub-surface soil structure. The completion of work from the barge would mean sub-surface disturbance is restricted to the area required for drilling as such any impacts would be localised.

###### **Aquatic Ecology Impacts**

The potential for benthic disturbance through direct removal of substrate only applies to drilling activities. Removal of these communities will result in the temporary loss of biodiversity from the impact areas however it is expected that biodiversity will not be permanently affected. Following the completion of the boreholes, the impacted seabed will be rapidly colonised by benthic species under a long-term natural recruitment process. It is expected that a mature community comparable to the one currently present, will be achieved within months of drilling activities being completed.

Indirect impacts may also occur to nearby communities, through the generation of turbid plumes and impacts of increased suspended sediment levels on filter-feeding organisms. These localised plumes are temporary and suspended sediments are expected to disperse rapidly.

###### **Noise**

Shallow marine surveys will generate underwater noise via the use of an acoustic signal (Squid 501). In addition, artificial noise will also be generated during vessel movements, and during drilling activities. Disturbance to marine fauna from above ground and underwater activities may occur in response to noise generated by these activities.

##### **3.3.3.2 Exploration and Survey Management and Mitigation Measures**

To manage impacts from the proposed survey and exploration activities, the following mitigation measures will be implemented.

## **General**

All exploration and survey activities will be carried out within standard work hours as defined by the Interim Construction noise Guideline being:

- Monday to Friday: 7:00 am to 6:00 pm.
- Saturday: 8:00 am to 1:00 pm.
- Sundays and public holidays: no work.

## **Drilling**

- Drilling will be conducted in accordance with Australian Standards (AS 1726:2017).
- No drilling in identified seagrass meadows or within 100m of identified artificial reefs.
- Drilling will be carried out using a method appropriate to the sediment characteristics within the particular site with the method reducing environmental impacts as far as practicable.
- Presence of marine mammals should be visually monitored by crew members for at least 30 minutes before the commencement of drilling, in particular within the shut-down zone (1 km), but also the observation zone (2 km) where possible - with observation continuing throughout operation.
- Drilling will be put on standby to shutdown in the event a marine mammal is observed to come within the observation zone during operation. The drill rig will then be shutdown if it comes within the shut-down zone, until such time that it leaves again.
- Waste drilling fluids will be captured and stored onboard for on-shore disposal through registered according to legislative requirements
- Physical controls such as silt curtains and/or drill collars will be implemented to contain any disturbance of sediment.
- Drill holes will be rehabilitated in accordance with Departmental guidelines upon completion of drilling activities.

## **Shallow Marine Survey**

- Shallow marine survey works will follow all relevant Legislation and Guidelines.
- Survey activities will implement mitigation measures outlined in EPBC Act Policy Statement 2.1 Part A (DEWHA, 2008) as appropriate for marine mammals.
- The interaction of all vessels with marine mammals will be compliant with Part 8 of the Environment Protection and Biodiversity Conservation (EPBC) Regulations (2000).

- The Australian Guidelines for Whale and Dolphin Watching (Commonwealth of Australia, 2017) for seafaring activities will also be implemented.
- All survey crew members will be briefed on EPBC Act Policy statement requirements, operations and stop work procedures, as well as low visibility procedures.
- Any other mitigation measures proposed by DPI-Fisheries will be implemented as appropriate in consultation with DPI-Fisheries (see Section 8.5 below).

The survey crew members will be following these mitigation and control procedures to avoid impact:

**For Marine Mammals:**

- Precaution zones will be implemented (Observation (3+ km), and Shut down (500 m)).
- Pre-start up visual observation of precaution zones (>30 mins before start).
- Survey line pass will not commence if marine mammals are within the low power or shut down zone within intended passage of vessel – alternate route will need to be selected.
- Crew will maintain vigilant observation for marine mammals within precaution zones and vessel planned path throughout shallow marine surveys.
- Survey array will be shut down if a marine mammal enters shut down zone.
- Any other mitigation measures proposed by DPI-Fisheries will be implemented as appropriate in consultation with DPI-Fisheries (see Section 8.5 below).

**For dolphins and whales:**

- Caution zone (300 m either side of whales and 150 m either side of dolphins) – vessels must operate at no wake speed in this zone.
- Caution zone must not be entered when calf (whale or dolphin) is present.
- No approach zone (100 m either side of whales and 50 m either side of dolphins) – vessels should not enter this zone and should not wait in front of the direction of travel or an animal or pod, or follow directly behind.
- If there is a need to stop, reduce speed gradually.
- Do not encourage bow riding. If animals are bow riding, do not change course or speed suddenly.
- Any other mitigation measures proposed by DPI-Fisheries will be implemented as appropriate in consultation with DPI-Fisheries (see Section 8.5 below).

- As noted above, many management measures reflect Commonwealth policy and guidelines for survey activities as they represent the most comprehensive recommendations for similar activities. As noted in Section 8.5 below, specific engagement with DPI-Fisheries will be undertaken to identify any additional management and mitigation measures that should be taken into consideration by Centennial Myuna when carrying out exploration and survey activities on Lake Macquarie.
- Should any unexpected impacts to marine species be identified during survey activities that could have been caused by the activities being undertaken, works will cease immediately. Works will not recommence unless Centennial, in consultation with DPI-Fisheries, are satisfied that impacts can be appropriately managed and any additional management or mitigation measures are implemented where necessary.

### 3.3.3.3 Notifications

Communication regarding proposed exploration and survey activities will be undertaken to:

- Ensure that relevant stakeholders are informed about the proposal.
- Provide stakeholders with an opportunity to ask questions and to identify areas of concern with respect to the proposal.
- Allow Centennial Myuna to implement an approach to stakeholder communications that is transparent and timely.
- Effectively and proactively identify and manage issues and risks.
- Keep accurate records of consultation and communication with stakeholders.

Prior to exploration activities being undertaken, notifications regarding the proposed activities will be provided to stakeholders as identified in Table 7 below. The below Stakeholders are considered to be minimum notification requirements and additional stakeholders may also be notified as relevant.

**Table 7 Exploration and Survey Stakeholder Notification**

| Stakeholder Group | Name   |
|-------------------|--|
| Government        | Resources Regulator  |
|                   | Department of Planning, Industry and Environment – Planning & Assessment Group |
|                   | Department of Primary Industries - Fisheries                                   |
|                   | Roads and Maritime Services  |
|                   | NSW National Parks and Wildlife Service  |
|                   | Lake Macquarie City Council  |
|                   | State MP   |

| Stakeholder Group                | Name  |
|----------------------------------|---|
| Lake Users                       | South Lake Macquarie Amateur Sailing Club       |
|                                  | Lake Macquarie Yacht Club                       |
|                                  | Royal Motor Boat Yacht Club Toronto             |
|                                  | Toronto Amateur Sailing Club                    |
|                                  | Marmong Point Marina                            |
|                                  | Teralba Amateur Sailing Club                    |
|                                  | Speers Point Amateur Sailing Club               |
|                                  | Mannering Park Amateur Sailing Club             |
|                                  | Wangi Amateur Sailing Club                      |
|                                  | Wangi RSL Fishing Club                          |
|                                  | Wye Point Marina                                |
| Lake Macquarie Game Fishing Club |   |
| Residents                        | Notification in local newspaper                 |
| Local Interest Group             | Myuna Colliery Community Consultative Committee |

#### 3.3.3.4 Engagement

##### Department of Primary Industries – Fisheries

Specific engagement with Department of Primary Industries – Fisheries will be undertaken to identify any additional mitigation and management measures that should be considered as part of the exploration and survey programs. Any mitigation measures proposed by DPI-Fisheries will be implemented as appropriate in consultation with DPI-Fisheries

##### Information Availability

Information regarding any exploration and survey activities will be made available on the Centennial website ([www.centennialcoal.com.au](http://www.centennialcoal.com.au)).

### 3.3.4 Ecology Monitoring

Annual monitoring of a patch of MU 42 Riparian Melaleuca Swamp Woodland at Myuna continues to be undertaken in line with the previous Biodiversity Management Plan (Centennial Coal 2016). Mapping Unit 42 forms part of the BC Act listed Swamp Sclerophyll Forest on Coastal Floodplains EEC and is also a GDE. Monitoring of the condition of the EEC will ensure health issues as a result of potential subsidence are appropriately addressed. Table 8 and Figure 4 show the monitoring locations and methods for this monitoring program. Monitoring reports will describe the outcomes of monitoring and land management actions for the coming year.

**Table 8 EEC monitoring locations**

| Vegetation Management Area                       | Type           | Purpose   | GPS Location  | Monitoring Design  | Monitoring Methodology                                      | Data Analysis   | Monitoring Frequency | Reporting Frequency |
|--|----------------|---|---|--|---|---|----------------------|---------------------|
| VMA 1: MU 42 in moderate/good (high) condition   | Biometric Plot | Monitoring and status of area following implementation of Management Measures | Plot 1: 366394.2E, 6341242N<br>Plot 2: 366537.9E 6341149N | Comparison of data collected from permanent monitoring sites (i.e. repeated measures analysis) | Two Permanent 20 m x 50 m Biometric plots<br>Braun-blanquet | Comparisons of site value scores year on year and with OEH benchmarks | Annually             | Annually            |
| VMA 2: MU 42 in moderate/good (medium) condition | Biometric Plot |   | Plot 3: 366747.9E 6340960N                                |  | One Permanent 20 m x 50 m Biometric plot<br>Braun-blanquet  |   |                      |                     |



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