METROPOLITAN COAL

REHABILITATION STRATEGY




Peabody ENERGY

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Revision Status Register

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1 INTRODUCTION

Metropolitan Coal is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd. Metropolitan Coal was granted Project Approval (08_0149) for the Metropolitan Coal Project (the Project) under Section 75J of the New South Wales (NSW) *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 22 June 2009 (the Approval). A copy of Project Approval (08_0149) is available on the Peabody website (http:/www.peabodyenergy.com.au).

The Project comprises the continuation, upgrade and extension of underground coal mining operations and surface facilities at the Metropolitan Coal Mine. The approved underground mining Project layout is shown on Figure 1. The Metropolitan Coal Mine Surface Facilities Area is shown on Figure 2.

1.1 PURPOSE AND SCOPE

The Rehabilitation Strategy has been prepared for the Metropolitan Coal Surface Facilities Area in accordance with Condition 2 of Schedule 6 of the Project Approval. Condition 2 states:

Rehabilitation Strategy - Surface Facilities Area

2. By the end of October 2011, the Proponent shall prepare a Rehabilitation Strategy for the surface facilities area to the satisfaction of the Director-General. This strategy must:

(a) be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Director-General;

(b) be prepared in consultation with relevant stakeholders, including WCC and the CCC;

(c) investigate options for the future use of the area upon the completion of mining;

(d) describe and justify the proposed rehabilitation strategy for the area; and

(e) define the rehabilitation objectives for the area, as well as the proposed completion criteria for this rehabilitation.

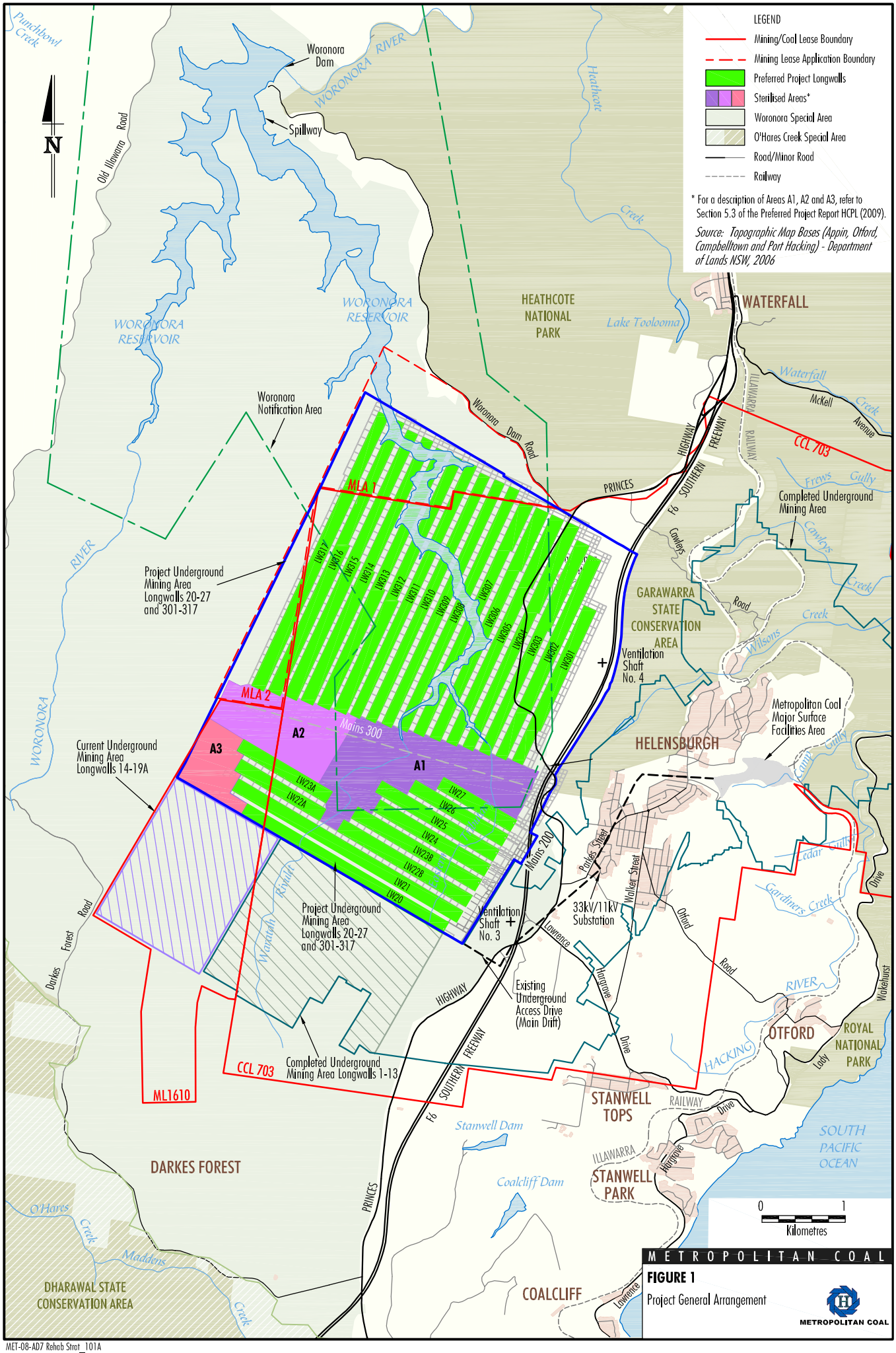
The team of suitably qualified experts who prepared the Rehabilitation Strategy included:

- Reece McDougall, Heritage Consultant, Godden Mackay Logan Pty Ltd.
- Elizabeth Norris, Ecologist/Botanist, Eco Logical Australia.
- Allan Watson, Civil Engineering Consultant, Allan Watson Associates Pty Ltd.

A letter requesting the approval of the above experts to prepare the Rehabilitation Strategy was sent to the DP&I on 8 July 2011. The DP&I endorsed the above experts in a letter to Metropolitan Coal dated 8 October 2011.

For the purposes of this Rehabilitation Strategy, relevant stakeholders are considered to include the Community Consultative Committee (CCC), the Wollongong City Council (WCC) and the Helensburgh and District Historical Society (H&DHS). Consultation with these stakeholders is discussed in Section 2.

The Rehabilitation Strategy has been developed to be a concise framework document which describes the development of rehabilitation objectives and completion criteria for the preferred future landuse for the Surface Facilities Area following the completion of mining activities. The Rehabilitation Strategy framework is illustrated on Figure 3. Detailed rehabilitation plans for the Surface Facilities Area will be developed over the life of the Project and will be presented in the Mine Closure Plan (MCP) and future revisions of the Rehabilitation Strategy.



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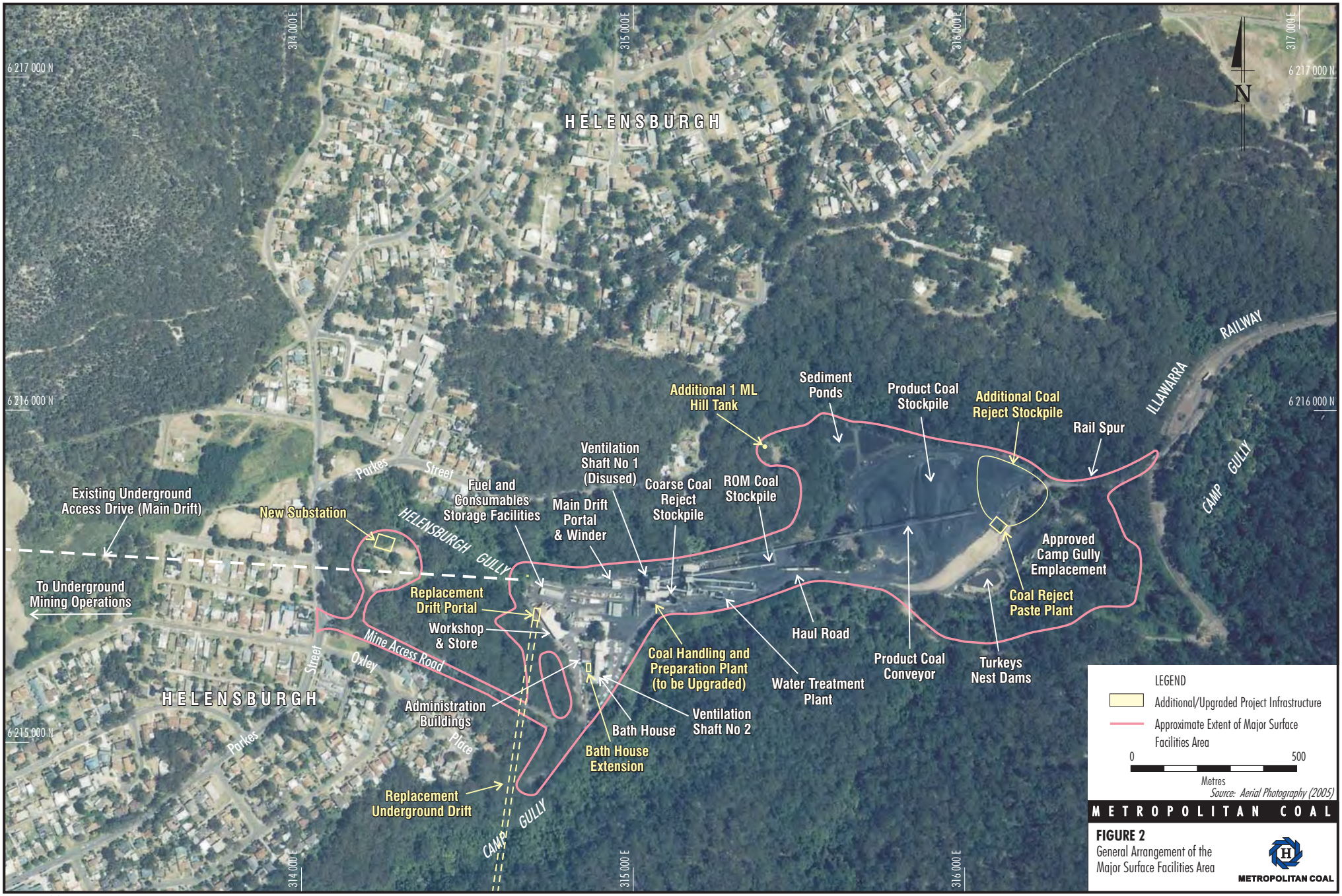

FIGURE 2
General Arrangement of the Major Surface Facilities Area

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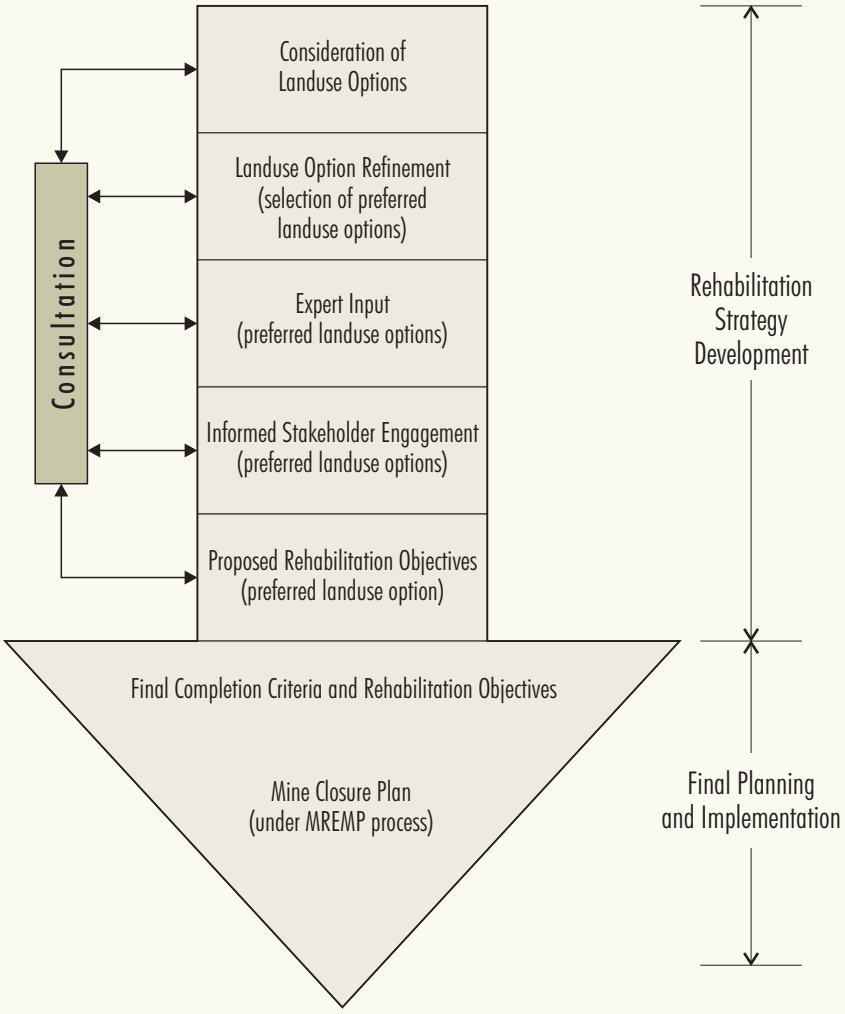

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FIGURE 3
Rehabilitation Strategy Framework

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As described in the Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia's *Strategic Framework for Mine Closure* (2000), proper mine rehabilitation and closure planning should be flexible enough to cope with unexpected events. As such, the Rehabilitation Strategy has been designed to be a dynamic document, with on-going consultation forming a key component in the definition of the final landuse option, rehabilitation objectives and completion criteria.

As various factors will influence the landuse options available for the Surface Facilities Area following the completion of mining activities, it is not possible for Metropolitan Coal to define a final landuse option (and associated final rehabilitation objectives and completion criteria) at this stage of the Project life. It is anticipated that operations at the Surface Facilities Area will continue for at least another 20 years. The final landuse and associated final rehabilitation objectives and completion criteria will be documented in future Mining Operations Plans (MOPs) and the MCP as part of the Mining, Rehabilitation and Environmental Management Process (MREMP). The MREMP is discussed further in Section 7.

The Rehabilitation Strategy will be reviewed in consultation with relevant stakeholders throughout the life of the Project.

1.2 STRUCTURE OF THE REHABILITATION STRATEGY

The remainder of the Rehabilitation Strategy is structured as follows:

- Section 2 describes the consultation undertaken during the development of the Rehabilitation Strategy.
- Section 3 describes the characteristics and historical context of the Surface Facilities Area.
- Section 4 describes potential future landuse options and the preferred future landuse option for the Surface Facilities Area.
- Section 5 outlines the preliminary rehabilitation objectives for the Surface Facilities Area.
- Section 6 proposes conceptual completion criteria for the Surface Facilities Area.
- Section 7 describes the MREMP and its relationship to the Rehabilitation Strategy.
- Section 8 describes how the Rehabilitation Strategy will be reviewed and updated.
- Section 9 lists the references cited.

1.3 DISTRIBUTION REGISTER

In accordance with Condition 10, Schedule 7 'Access to Information', Metropolitan Coal will make the Rehabilitation Strategy publicly available on the Peabody website. A hard copy of the Rehabilitation Strategy will also be maintained at the Metropolitan Coal site.

Metropolitan Coal recognises that various regulators have different distribution requirements, both in relation to whom documents should be sent and in what format. An Environmental Management Plan and Monitoring Program Distribution Register has been established in consultation with the relevant agencies and infrastructure owners that indicates:

- to whom the Metropolitan Coal plans and programs, such as the Rehabilitation Strategy, will be distributed;

- the format (i.e. electronic or hard copy) of distribution; and
- the format of revision notification.

Metropolitan Coal will make the Distribution Register publicly available on the Peabody website.

Metropolitan Coal is responsible for maintaining the Distribution Register and for ensuring that the notification of revisions is sent by email or post as appropriate.

In addition, Metropolitan Coal employees with local computer network access will be able to view the controlled electronic version of this Rehabilitation Strategy on the Metropolitan Coal local area network. Metropolitan Coal will not be responsible for maintaining uncontrolled copies beyond ensuring the most recent version is maintained on Metropolitan Coal's computer system and the Peabody website.

2 CONSULTATION

2.1 SPECIALIST INPUT

Metropolitan Coal engaged heritage consultants Godden Mackay Logan Pty Ltd to conduct a review of the heritage setting of the Project and develop options for the management of heritage items during the life of the Project and following mine closure. Godden Mackay Logan Pty Ltd were also engaged to assist in consultation with the WCC, the CCC and the H&DHS.

Eco Logical Australia assisted in the development of the revegetation strategy as discussed in Section 5.4 and 5.5. Eco Logical Australia has an ongoing role in vegetation monitoring at the Project, and will continue to provide specialist advice on rehabilitation activities at the Project.

Metropolitan Coal also engaged Allan Watson Associates Pty Ltd (civil engineering consultants) to provide advice on landform design at the Surface Facilities Area following completion of mining activities, as discussed in Section 5.5.

2.2 COMMUNITY CONSULTATIVE COMMITTEE

A CCC has been established under Condition 5, Schedule 7 of the Project Approval to provide a forum for open discussion between Metropolitan Coal, the community, the WCC and other stakeholders on issues directly relating to the Project's operations, environmental performance and community relations, and to keep the community informed on these matters (NSW Department of Planning, 2007). In accordance with Condition 2, Schedule 6 of the Project Approval, Metropolitan Coal will continue to consult with the CCC in relation to the Rehabilitation Strategy.

The Rehabilitation Strategy was discussed at a CCC meeting held in Helensburgh on 2 August 2011. Attendees included local community representatives, a WCC officer, members of the H&DHS and Metropolitan Coal staff. Reece McDougall, Chief Executive Officer of Godden Mackay Logan Pty Ltd, made a special presentation to the CCC on the cultural heritage items located within the Surface Facilities Area and described the potential management options during the Project life and following the completion of mining activities. Mr McDougall provided examples from Australia and overseas where heritage items have been re-used in the form of interpretive exhibits following their decommissioning, and explained how a similar approach could be taken to the heritage items within the Surface Facilities Area.

Metropolitan Coal was interested in obtaining the views of the CCC members on the management options for each heritage item. A number of committee members indicated their interest in being further involved with the ongoing development of the Rehabilitation Strategy, and in Metropolitan Coal's proposal to conduct an oral history and detailed recording of the heritage items.

A further meeting was held with Metropolitan Coal representatives, Mr McDougall and CCC members Michelle Chambers and Bob Scullion on 16 August 2011 to further discuss community views on heritage management. The development of the Three-phase Heritage Strategy and preferred landuse option (discussed in Section 4.1.2) is a result of ideas discussed during this consultation.

Metropolitan Coal will continue to consult with the CCC in regard to the Rehabilitation Strategy over the life of the Project.

2.3 WOLLONGONG CITY COUNCIL

Metropolitan Coal is required under Condition 2, Schedule 6 of the Project Approval to consult with the WCC in relation to this Rehabilitation Strategy.

A WCC officer was present at the CCC meeting on 2 August 2011, when the special presentation on the heritage context of the Metropolitan Coal Mine was made by Mr McDougall.

Metropolitan Coal representatives and Mr Peter Romey (Partner, Godden MacKay Logan Pty Ltd, as representative for Mr McDougall) met with Mr Joel Thompson (Heritage Officer with the WCC) on 26 September 2011 to further discuss the WCC's views on the Rehabilitation Strategy.

At this meeting, the WCC suggested that the *Strategic Management Plan for Historic Coal Mining Sites of the Illawarra* (O.H.M. Consultants, 2006) be considered in the development of the Rehabilitation Strategy (Section 5.7). In addition, the WCC indicated that aspects of the *Metropolitan Colliery Conservation Management Plan* (Pearson, 2009) should be incorporated into the Rehabilitation Strategy. Section 3.2 describes the purpose of the *Metropolitan Colliery Conservation Management Plan*.

The WCC also suggested that areas of ecological restoration and heritage conservation be demarcated and separated in a manner designed to minimise the potential for bushfire impacts on heritage items. This suggestion will be considered in any decisions made in relation to final landform designs.

The WCC raised the possibility that the Metropolitan Coal Mine could one day be included on the State Heritage Register. Metropolitan Coal will undertake consultation with the NSW Office of Environment and Heritage in relation to this matter, and any outcomes will be included in future revisions of the Rehabilitation Strategy.

Metropolitan Coal will continue to consult with the WCC in regard to the Rehabilitation Strategy over the life of the Project. Metropolitan Coal will also consult with the NSW Office of Environment and Heritage and the Heritage Council of NSW in regard to the management of heritage items during the life of the Project and following the completion of mining activities.

2.4 HELENSBURGH AND DISTRICT HISTORICAL SOCIETY

The H&DHS records and preserves the social history of Helensburgh and the surrounding villages of Waterfall, Garawarra, Stanwell Park, Stanwell Tops, Otford, Lilyvale and Cawley.

The current President of the H&DHS, Allan House is a member of the CCC and was present at the CCC meeting held on 2 August 2011 when the Rehabilitation Strategy was discussed. Allan subsequently provided comments on the Rehabilitation Strategy on 8 August 2011.

Metropolitan Coal will continue to consult with the H&DHS in regard to the Rehabilitation Strategy over the life of the Project.

3 SURFACE FACILITIES AREA

3.1 LOCAL SETTING

The Metropolitan Coal Mine Surface Facilities Area is located in the town of Helensburgh, approximately 30 km north of Wollongong. Founded in 1888, the Metropolitan Coal Mine is the oldest continually operating coal mine in Australia. The town of Helensburgh was originally established for railway workers constructing the Illawarra Railway Line between 1884 and 1888, and continued to grow with the development of the Metropolitan Coal Mine. Helensburgh now has a population of approximately 5,000 (Australian Bureau of Statistics, 2006).

The Surface Facilities Area is located within Camp Gully to the east of Helensburgh, a densely vegetated, steep sided valley which restricts views of the complex to a limited number of immediately surrounding dwellings and publicly accessible locations. The complex includes administration buildings, workshops, storerooms and the Coal Handling and Preparation Plant. Other surface facilities located outside of the existing Surface Facilities Area include the Ventilation Shaft No. 3, which is located to the west of the F6 Southern Freeway (Figure 1).

3.2 HERITAGE ITEMS

Dr. Michael Pearson developed the *Metropolitan Colliery Conservation Management Plan* (2009) to provide a background to the heritage significance of the Metropolitan Coal Mine. The document provides guidance for the management of heritage items during the detailed design, construction and operational phases of infrastructure development at the Surface Facilities Area. The Conservation Management Plan will be used to guide the management of heritage items, and will be reviewed and revised as necessary following further assessments of the heritage items and consultation with relevant parties.

The *Metropolitan Colliery Conservation Management Plan* identified 14 existing heritage items within the Surface Facilities Area. An inventory of these heritage items is provided in Table 1 and Plates 1 to 5 show some of the heritage items located within the Surface Facilities Area.

A number of heritage items relating to the historical mining activities at the Metropolitan Coal Mine are located within the Surface Facilities Area, however many of the earliest structures have been demolished or modified over time as a result of the introduction of new technology and practices for underground coal mining. Some of these heritage items are listed in the Heritage Schedule to the Wollongong Local Environmental Plan, although none are listed on the State Heritage Register or National Heritage List.

Many aspects of the Metropolitan Coal Mine are found elsewhere, although the Shaft No. 2 headframe, Koepe winder and fan evase, bathhouse, underground stables and drift winder engine and house are uncommon in NSW.

Table 1
Metropolitan Coal Inventory of Heritage Items

Item	Significance	Condition[1]	Integrity[2]	Current Use
Shaft No.1 Headframe	Local	Fair	Moderate	Remnant – none
1889 Water Tank	Local	Good	Moderate-low	Remnant – none
Drift Portal Winding House	State	Good	High	To be decommissioned
Powerhouse	Local	Poor	Moderate	Remnant – none
Coal Washery	Local	Good	Poor	Subject to upgrade works
Shaft No. 2 and Koepe Winder	State	Good	High-moderate	Operational asset
Shaft No. 2 Fan Evase	State	Good-fair	Moderate	Operational asset
Bathhouse	State	Good-fair	High	Operational asset
Mine Manager's Residence	Local	Good-fair	High	Operational asset
Camp Creek Culvert	Local	Good	High	Remnant – none
Railway Siding Viaduct	Local	Poor	Low-moderate	Remnant – none
Rail Tunnel No.5	Local	Good	High	Remnant – none
Colliery Office	Local	Good	High-moderate	Operational asset
Underground Stables	State	Poor	High	Redundant
Power Pylon	Local	Very poor	Moderate	Remnant – none
Reduction Pond	Local	Poor	Low	Remnant – none
Camp Creek Weir	Local	Poor	High	Remnant – none
Rail Tunnel No. 4	Local	Unknown	Moderate	Remnant – none

Source: Metropolitan Colliery Conservation Management Plan (Pearson, 2009).

[1] Condition refers to the state of a place or the component of a place – the extent to which it is well maintained and is physically sound (Pearson, 2009).

[2] Integrity refers to the degree to which a place or component of a place retains the form and completeness of its physical fabric, historical associations, use or social attachments that give the place its cultural significance (Pearson, 2009).

3.3 VEGETATION

The vegetation surrounding the Surface Facilities Area has been inspected in numerous surveys over the life of the mine (Bangalay Botanical Surveys, 2008), and has found to be highly disturbed due to historical mining activities (FloraSearch, 2010). The disturbance areas, including earthworks for water diversion drains, pipelines, powerlines, access tracks and buildings, have been recolonised by native pioneer plant species and a range of introduced colonising plants. In particular, the past soil disturbance has provided a favourable environment for introduced environmental weeds including Lantana (*Lantana camara*), Mist Flower (*Ageratina riparia*) and Crofton Weed (*Ageratina adenophora*) which now dominate the understory (FloraSearch, 2010).

Plate 1 Shaft No. 1 Headframe

Plate 2 Drift Portal Winding House

Plate 3 Powerhouse

Plate 4 Shaft No. 2 and Keope Winder

Plate 5 Shaft No. 2 Fan Evase

Source: *Conservation Management Plan (Pearson, 2009)*

Past disturbance and the invasion of exotic species have resulted in the loss of most native species comprising the original shrub and ground cover layers. Surveys conducted by FloraSearch at three sites around the Surface Facilities Area in 2010 concluded that the vegetation at all three sites is in poor condition relative to the original undisturbed communities, owing to a considerable loss of groundcover and shrub diversity and dominance by aggressive weeds (FloraSearch, 2010).

In addition, Bangalay Botanical Surveys conducted vegetation surveys of the Camp Gully coal reject emplacement area (Figure 2) in 2008 (Bangalay Botanical Surveys, 2008). Bangalay Botanical Surveys noted the following during the surveys of the Camp Gully coal reject emplacement area (Bangalay Botanical Surveys, 2008):

- current or prior disturbance of native vegetation;
- distribution and abundance of weeds;
- the occurrence of imported soil and fill;
- roads and tracks; and
- alterations to site drainage characteristics and indication of fire regimes.

The above observations are consistent with the conclusions made by FloraSearch (2010) in relation to the poor condition of the vegetation surrounding the Surface Facilities Area.

3.4 THREATENED FLORA SPECIES AND ENDANGERED ECOLOGICAL COMMUNITIES

Surveys by FloraSearch (2010) and Bangalay Botanical Surveys (2008) in various locations around the Surface Facilities Area found no threatened flora species listed under the NSW *Threatened Species Conservation Act, 1995* or the *Environmental Protection and Biodiversity Conservation Act, 1999*, although Bangalay Botanical Surveys (2008) found that suitable habitat existed for a number of threatened species.

One Endangered Ecological Community, Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion, was recorded in the Camp Gully coal reject emplacement area by Bangalay Botanical Surveys (2008). Any rehabilitation works designed under the Rehabilitation Strategy would avoid or minimise disturbance in this area.

3.5 PHYSICAL CONSTRAINTS

The physical characteristics of the Surface Facilities Area are important when considering the future landuse options, rehabilitation objectives and completion criteria. These physical characteristics place constraints on what is possible to achieve in a rehabilitation program for the Surface Facilities Area (Commonwealth Department of Industry, Tourism and Resources, 2006b). Some of these physical characteristics include the climate, size and soil/rock types, topography, watercourses and surrounding vegetation. These physical constraints will be considered during the development of detailed rehabilitation plans in relation to landform design and revegetation.

4 FUTURE LANDUSE OPTIONS

As shown on Figure 3, the first stage in the development of the Rehabilitation Strategy involved the consideration of a number of potential future landuse options for the Surface Facilities Area. The potential future landuse options that were considered, and the associated key benefits and issues are presented in Table 2.

Table 2
Potential Future Landuse Options

Potential Future Landuse Option	Key Benefits	Key Issues
1. Demolition of all infrastructure and rehabilitation of the Surface Facilities Area to a stable native environment.	Promotes the re-establishment of native vegetation communities and improves the visual amenity of the site. Removes the public safety risk associated with retaining infrastructure. Decreased ongoing liability associated with potentially hazardous infrastructure.	Destruction of heritage items and limited opportunity to promote the heritage value of the site. Loss of community attachment to the mine site. No beneficial re-use of infrastructure such as buildings, roads, services etc.
2. Retention of all heritage items on-site without alteration of the infrastructure.	Highest preservation of heritage value. No requirement to demolish or relocate infrastructure off-site.	Safety issues associated with retention of certain heritage items. Minimal scope for beneficial re-use of the area. Requirement for ongoing maintenance of infrastructure.
3. Redevelop to an industrial area or residential estate.	Opportunity to relinquish the site and the associated liability to a developer. Socio-economic benefits to the local community. Continued use of existing infrastructure (e.g. access roads, services etc.).	Limited availability of suitable land. Loss of heritage significance of the site due to a change in land use. There may not be a requirement for additional housing in the local area once the mine is closed.
4. Retention of certain heritage items and development of an interpretative centre.	Preserves a significant amount of the site's heritage in its existing context. Allows for the continued use of the area by the community following mine closure. Reduces public safety risk.	Heritage items must not present a risk to public safety. On-going liability to maintain the infrastructure retained on-site.

4.1 FUTURE LANDUSE OPTION SELECTION PROCESS

The Rehabilitation Strategy presents a framework for the selection of a future landuse and relevant rehabilitation objectives and completion criteria. The framework is illustrated on Figure 3 and involves consultation with relevant stakeholders and specialists over the life of the Project.

4.1.1 Management of Heritage Items

There are a range of options available for the short-term management of heritage items on-site (e.g. to be implemented prior to mine closure). These options include:

- maintain and repair as part of ongoing operations;
- adapt by retaining items, but introducing a new use;
- sympathetic addition/upgrade;
- retain and interpret *in situ*;
- relocate and interpret; and
- record and remove consistent with advice from heritage specialists.

The suitability of a management option for a particular heritage item depends on a number of factors including the significance, condition, integrity, contamination, safety issues and proposed future use of the heritage item within the Surface Facilities Area.

Metropolitan Coal will develop and implement a draft Interpretation Plan which will include a detailed recording of the 14 heritage items identified in the *Metropolitan Coal Mine Conservation Management Plan* (Pearson, 2009) in consultation with the local community (through the CCC) and the WCC. The draft Interpretation Plan and recording of the heritage items will be used to determine the suitability of particular management options for each heritage item. The draft Interpretation Plan will be included as an attachment to future revisions of the Rehabilitation Strategy.

In accordance with the *Strategic Management Plan for Historic Coal Mining Sites of the Illawarra* (O.H.M. Consultants, 2006), Metropolitan Coal will undertake an oral history of the site with the H&DHS and any other interested stakeholders.

4.1.2 Preferred Future Landuse Option

Due to the historical significance of mining activities at the Metropolitan Coal Mine, and in line with the outcomes of consultation with relevant stakeholders and specialists (Section 2), Metropolitan Coal's preferred future landuse for the Surface Facilities Area involves the retention of some items of mining heritage, the re-establishment of a stable landform and native vegetative communities, and the creation of an interpretive centre for the benefit of the community.

The development of an interpretive centre at the Surface Facilities Area may include the following:

- general interpretative signage to provide information on the history of the mine and the development of the Helensburgh community;
- the retention and re-use of certain heritage items (e.g. utilising the Mine Managers residence as a central meeting place for historical tours);
- retention and interpretation of suitable structures (e.g. retaining structurally stable items such as the drift portal winder house for visitors to examine); and
- relocation and interpretation of other structures (e.g. relocating the Shaft No. 1 Headframe to allow for rehabilitation at the Surface Facilities Area).

This approach has been used in the rehabilitation management of World Heritage mining sites, such as the construction of a mining monument on top of the Line of Load at Broken Hill and the adaptive re-use of the Burly Griffin Incinerator at Willoughby.

Godden Mackay Logan Pty Ltd has proposed a Three-phase Heritage Strategy for the implementation of the preferred future landuse option, as described in Table 3.

Table 3
Three-phase Heritage Strategy for the Preferred Future Landuse Option

Phase	Action	Implementation
1	Include a heritage/history display including video material in the new Metropolitan Coal Shopfront in Walker Street, Helensburgh.	2011 to 2014.
2	Relocate the current functions in the former Mine Manager's residence to other on-site facilities. Adaptively re-use the residence for heritage purposes (e.g. meeting place, visitor centre, museum, key point in a heritage trail).	Mine closure onwards.
3	Use the Mine Manager's residence to provide a heritage trail for the upper rehabilitated section of the mine displaying the interpretation and remnant structures of its mining history.	Mine closure onwards.

This preferred landuse option of retaining certain items of heritage significance at the Metropolitan Coal Mine maintains the historical significance of the site by conserving its history within the local area.

It is anticipated that existing cleared areas (e.g. stockpile pads, car parks, roads etc.) and areas where infrastructure items are removed would be rehabilitated to a stable landform with the establishment of self sustaining vegetation (see the rehabilitation objectives in Section 5).

This preferred future landuse option remains subject to development through the MREMP, as discussed in Section 7. Notwithstanding this, rehabilitation objectives and conceptual completion criteria, discussed in Sections 5 and 6 respectively, are based on this preferred future landuse option.

4.1.3 Final Landuse Option

Metropolitan Coal cannot commit to a particular final landuse option at this stage of the Project life given that future development of the mine, development of the community and potential changes to policies regarding mine closure over the next 20 years are likely to influence the final landuse.

4.2 SOCIAL ASPECTS

Helensburgh was established to service the Metropolitan Coal Mine in the late 1800s and continues to rely on the mine in the present day (Section 3.1). A number of Helensburgh residents are directly employed at the mine, and many more jobs in the local area are directly and indirectly associated with servicing the mine.

Closure of the Metropolitan Coal Mine would result in a contraction in regional activity (Gillespie Economics, 2008). The magnitude of the regional economic impacts of mine closure would depend on the number of Metropolitan Coal employees and their families that leave the region. If some of the workers remain in the region, then the economic impacts of mine closure would not be as severe compared to a greater proportion leaving the region. This is because the consumption-induced flow-on effects from mine closure would be offset through the continued consumption expenditure from the employees who stay (Gillespie Economics, 2008).

The decision by Metropolitan Coal employees to stay in the region following mine closure would be affected by a number of factors, including the potential employment opportunities available and the extent of 'attachment' to the local region (Economic and Planning Impact Consultants, 1989).

5 REHABILITATION OBJECTIVES

The Project Approval requires Metropolitan Coal to achieve the rehabilitation objectives in Table 11 of Condition 1, Schedule 6, reproduced below. An additional column has been added to Table 11 from the Project Approval to outline the relevant Metropolitan Coal Management Plan in which each rehabilitation domain is covered in more detail.

Table 11: Rehabilitation Objectives

Domain	***Rehabilitation objective***	**Relevant Plan(s)**
Surface Facilities Area	*Set through condition 2 below*	**Metropolitan Coal Rehabilitation Strategy**
Waratah Rivulet, between the downstream edge of Flat Rock Swamp and the full supply level of the Woronora Reservoir *Eastern Tributary, between the maingate of Longwall 26 and the full supply level of the Woronora Reservoir*	*Restore surface flow and pool holding capacity as soon as reasonably practicable*	Metropolitan Coal Rehabilitation Management Plan
Cliffs	*Ensure that there is no safety hazard beyond that existing prior to mining*	Metropolitan Coal Longwalls 20-22 Public Safety Management Plan
Other land affected by the project	*Restore ecosystem function, including maintaining or establishing self-sustaining native ecosystems:* • *comprised of local native plant species; with* • *a landform consistent with the surrounding environment*	Metropolitan Coal Rehabilitation Management Plan
Built features	*Repair/restore to pre-mining condition or equivalent*	Metropolitan Coal Longwalls 20-22 Built Features Management Plan
Community	*Minimise the adverse socio-economic effects associated with mine closure including the reduction in local and regional employment* *Ensure public safety*	**Metropolitan Coal Rehabilitation Strategy**

5.1 PEABODY CORPORATE COMMITMENTS

Peabody's primary environmental objective is to restore land to a productive condition that provides lasting benefits to future generations. A key principle of Peabody's mission is to "leave the land in a condition equal to or better than we found it". Peabody remains committed to managing operations in a way that minimises any adverse impacts they may have on the environment and the communities in which they operate. Peabody embraces the concept of sustainable development and pledges to conduct its activities in a manner that recognises the needs of society and economic prosperity, national security and a healthy environment.

5.2 GENERAL REHABILITATION OBJECTIVES

Rehabilitation of the Surface Facilities Area will be conducted in accordance with the following general rehabilitation objectives:

- Rehabilitation will be consistent with the requirements of the Project Approval, Environmental Assessment, Management Plans and other relevant environmental management documents prepared for Metropolitan Coal.
- Rehabilitation will comply with regulatory requirements relating to mine rehabilitation, mine closure and local planning.
- Rehabilitation will be conducted progressively over the life of the Project.
- Rehabilitated sites will be left clean and tidy and not present a hazard to people or native fauna.
- The conservation and development of the heritage items at Metropolitan Coal will be carried out in accordance with the principles of *The Burra Charter* (Pearson, 2009).

5.3 HERITAGE MANAGEMENT

Items of heritage significance are to be managed in accordance with the *Metropolitan Colliery Conservation Management Plan* (Pearson, 2009). Detailed recording of heritage items will be conducted over the life of the Project (e.g. through the implementation of an active oral history program and photographic recordings).

Heritage items that are to be retained, whether on or off-site, will be made safe to minimise safety risks to the public. Advice on the structural integrity of all heritage items will be sought from an appropriately qualified structural engineer.

5.4 LANDFORM DESIGN, SOIL STABILISATION AND EROSION CONTROL

The primary objective of the landform design works following completion of mining activities is to establish a geotechnically stable, low maintenance landform which is not susceptible to erosion. The following rehabilitation objectives have been proposed by Allan Watson Associates Pty Ltd and Eco Logical Australia:

- Stabilisation of all earthworks, drainage lines and disturbed areas required for mine-related activities to minimise the potential for erosion and sedimentation.
- Re-profiling (e.g. terracing) of slopes to form a geotechnically stable batter which allows effective drainage.

- Establishment of stable watercourses through and around the rehabilitated Surface Facilities Area to Camp Gully.
- Minimisation of runoff through rehabilitated areas which are yet to stabilise.
- Establishment of erosion and sediment control measures in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). Maintenance of erosion and control measures until such time as a stable landform is established.
- Integration of the final landform into the surrounding topography.
- Remediation of any land contaminated by mining.

5.5 REVEGETATION AND HABITAT CREATION

The primary objective of the revegetation works following completion of mining activities is to establish a self-sustaining vegetative cover appropriate to the landforms being revegetated. The following rehabilitation objectives have been proposed by Eco Logical Australia:

- Development of a self-sustaining native ecosystem comprised of local native plant species consistent with pre-mining and surrounding vegetation communities and landforms.
- Creation of habitat for threatened flora.
- Provision of habitat for threatened fauna and corridors for fauna movement within the final landform.
- Control of vermin, feral animals and noxious weeds.
- Monitoring of rehabilitation success in terms of physical and biological parameters.

Revegetation of remnant communities will be done using provenance species. The surrounding vegetation is characterised by a tall forest supporting a canopy of Blackbutt (*Eucalyputs pilularis*), Bangalay (*Eucalyptus botryoides*) and Turpentine (*Syncarpia glomulifera*) with a sub-canopy of smaller trees and a range of shrubs and groundcover species. Species selection for revegetation works can be drawn from the vegetation community description and diagnostic species listings (NPWS no date), and from floristic surveys in areas adjacent to the Surface Facilities Area. Flora species suitable for the re-establishment of remnant vegetation communities are provided in Appendix A.

5.6 COMMUNITY

The rehabilitation objective for the community, *viz. Minimise the adverse socio-economic effects associated with mine closure including the reduction in local and regional employment*, is described in Section 5.6.1.

The rehabilitation objective for the community, *viz. Ensure public safety*, is addressed in Section 5.6.2 for the Surface Facilities Area and in the *Metropolitan Coal Public Safety Management Plan* for the underground mining area and surrounds.

5.6.1 Socio-economic Effects

As discussed in Section 4.1, the socio-economic effects associated with mine closure will involve a contraction in regional activity (Gillespie Economics, 2008). These socio-economic effects have been considered by Metropolitan Coal in the selection of the preferred future landuse option, which is designed to partly offset the impact of mine closure on the local community by attracting tourism to the region.

The socio-economic effects associated with mine closure will be further addressed in the MCP and considered in consultation with the local community (though the CCC) when determining the final landuse option.

5.6.2 Public Safety

Most mining infrastructure at the Surface Facilities Area would be removed following the completion of mining activities. It is envisaged that some heritage items would be retained as part of the preferred future landuse for the Surface Facilities Area, which involves the retention of some items of mining heritage to create an interpretive centre as a community/tourist destination. Risks to public safety will be minimised by conducting works on heritage items chosen to be left on-site to make them structurally sound and non-hazardous. A structural engineer would be engaged to conduct an assessment of the risks to public safety from all infrastructure to be retained on-site.

5.7 STRATEGIC MANAGEMENT PLAN FOR HISTORIC COAL MINING SITES OF THE ILLAWARRA

Metropolitan Coal will generally follow the recommendations to mine owners stated in the *Strategic Management Plan for Historic Coal Mining Sites of the Illawarra* (O.H.M. Consultants, 2006):

1. All mines with access to workings should produce an underground film of previous workings and current operations.
2. Implement an active oral history program.
3. Conservation Management Plan produced for each mine before active production ceases and include public participation.
4. Establishment of Community Enhancement Programs with any new Development Applications.

Metropolitan Coal will produce an underground film of previous workings and current operations.

As discussed in Section 4.1.1, Metropolitan Coal will undertake an oral history of the site with the H&DHS.

Dr. Michael Pearson prepared the *Metropolitan Colliery Conservation Management Plan* on behalf of Metropolitan Coal for the Surface Facilities Area in 2009. The *Metropolitan Colliery Conservation Management Plan* would be reviewed and revised in conjunction with the Rehabilitation Strategy as appropriate over the life of the Project.

Metropolitan Coal will continue to donate to the community through various sponsorships and philanthropic programs, rather than through the creation of a new Community Enhancement Program with each new Development Application. These sponsorships and philanthropic programs include:

- Community projects such as local festivals and shows, school sports and infrastructure.
- Environmental awareness through local environmental groups.

- Education and training such as trade programs in local schools and graduate programs.
- Youth development in areas of arts, sport, health and safety.
- Employee involvement in the Helensburgh region.

Metropolitan Coal also makes annual road maintenance contributions to the WCC, as required by Condition 18, Schedule 3 of the Project Approval.

As indicated by the WCC during the consultation process and recommended by O.H.M. Consultants (2006) in the *Strategic Management Plan for Historic Coal Mining Sites of the Illawarra*, the Metropolitan Coal Mine may one day be added to the State Heritage Register. Metropolitan Coal will consult with the NSW Office of Environment and Heritage in regard to this matter.

6 COMPLETION CRITERIA

Final completion criteria for the final performance objectives will be developed following rehabilitation trials and ongoing consultation with relevant stakeholders, and will be in accordance with contemporary guidelines and policies. The final completion criteria will be described in future revisions of the Rehabilitation Strategy and the MCP.

Conceptual completion criteria for the key rehabilitation objectives which may be used to measure the success of rehabilitation activities at the Surface Facilities Area are presented in Table 4.

Table 4
Conceptual Completion Criteria

Key Rehabilitation Objective	Potential Completion Criteria
Establishment of a low maintenance, geotechnically stable landform.	Slopes and batters have been reshaped to remain geotechnically stable.
	Temporary erosion and sediment controls have allowed the rehabilitated landforms to stabilise and a vegetative cover to become established.
	Drainage controls and pathways effectively manage surface water runoff from rehabilitated areas.
	Contaminated sites have been remediated such that there are no impacts on the surrounding environment.
Establishment of a self-sustaining vegetative cover.	A self-sustaining vegetative cover comprised primarily of endemic species and communities has established on rehabilitated landforms.
	Sufficient ground cover has established to prevent soil erosion and minimise the spread of weeds and exotic species.
	Suitable habitat for fauna movement have been incorporated into the final landform.
Minimise risks to public safety.	Heritage items retained on-site have been inspected and declared structurally sound by a structural engineer and do not present a hazard to public safety.

7 MINING, REHABILITATION AND ENVIRONMENTAL MANAGEMENT PROCESS

The MREMP is comprised of the MOP, Annual Reviews and the MCP. As stated in the *Guidelines to the Mining, Rehabilitation and Environmental Management Process* (NSW Department of Primary Industries - Mineral Resources, 2006), the MREMP aims to ensure that rehabilitation achieves a stable, satisfactory outcome.

The MREMP is also designed to be flexible in response to changing circumstances (NSW Department of Primary Industries - Mineral Resources, 2006). As such, the MREMP will be used over the life of the Project to better refine the preliminary rehabilitation objectives and completion criteria based on rehabilitation trials, surveys, continued consultation and future activities at the Surface Facilities Area. In addition, the MREMP will refine the future landuse options for the Surface Facilities Area.

Metropolitan Coal is aware of the provisions of the *Mining Amendment Act, 2008,* which would amend the *Mining Act, 1992* to replace the MREMP with the requirement to submit a Rehabilitation and Environmental Management Plan. Metropolitan Coal's future revisions to the Rehabilitation Strategy and other management documents will appropriately reflect these amendments once they have entered into force.

7.1 MINING OPERATIONS PLAN

The MOP is a prospective document, in that it describes how Metropolitan Coal intends to conduct mining, processing and rehabilitation consistent with its Project Approval (NSW Department of Primary Industries – Mineral Resources, 2006). Metropolitan Coal has prepared a MOP for the operating period 2005 to 2012 and will prepare a MOP for the period 2012 to 2019. Under the *Guidelines to the Mining, Rehabilitation and Environmental Management Process* (NSW Department of Primary Industries - Mineral Resources, 2006), a MOP that does not include the final rehabilitation and closure phase of the mine may deal with future rehabilitation as concepts rather than in detail.

7.2 ANNUAL REVIEW

The Annual Review is a retrospective document, whereby Metropolitan Coal is required by Condition 3, Schedule 7 of its Project Approval to annually review the environmental performance of the project for a particular 12 month period. The findings of the Annual Reviews will be considered when developing the final landuse, rehabilitation objectives and completion criteria. Furthermore, the Annual Reviews will include a description of any revisions to the Rehabilitation Strategy during the reporting period.

7.3 MINE CLOSURE PLAN

A MCP for the Metropolitan Coal Mine will be developed in consultation with relevant agencies and stakeholders and will present the rehabilitation measures for the Surface Facilities Area and any other remaining disturbance areas. As described in the *Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion* (Commonwealth Department of Industry, Tourism and Resources, 2006a), the MCP is a "*living document that will be continually reviewed and revised over the mine's life*".

The final revision of the MCP will be the ultimate management document for mine closure and present the final landuse for the Surface Facilities Area as well as the final rehabilitation objectives and completion criteria. The final revision of the MCP will be informed by:

- the local community's views towards the end of the Project life;
- rehabilitation trials and studies which have occurred over the Project life; and
- development of the Surface Facilities Area which will occur over the Project life.

8 REHABILITATION STRATEGY REVIEW AND UPDATE

As described in Section 1.1, the Rehabilitation Strategy will be regularly reviewed and revised as necessary following consultation with relevant stakeholders, outcomes of rehabilitation trials and changes to rehabilitation guidelines and policies. The framework strategy illustrated on Figure 3 shows how consultation will influence all stages of the development of the final landuse option, and this will be reflected through regular review of the Rehabilitation Strategy.

As the life of the Project nears its end, a final landuse and associated rehabilitation objectives and completion criteria will be developed and included in future revisions of the Rehabilitation Strategy and the MCP.

9 REFERENCES

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APPENDIX A

FLORA SPECIES SUITABLE FOR REVEGETATION WORKS

Table A-1

Flora Species Suitable for Revegetation Works

Species	Common Name
Eucalyptus pilularis	Blackbutt
Eucalypts botryoides	Bangalay
Syncaria glomulifera	Turpentine
Allocasuarina torulosa	Forest Oak
Pittosporoum undulatum	Sweet Pittosporum
Livistona australis	Cabbage Palm
Acacia maidenii	Maiden's Wattle
Synoum glandulosum	Scentless Rosewood
Lomandra longifolia	Spiny-headed Matt-rush
Calochlaena dubia	Sift Bracken
Hibbertia denatata	Trailing Guinea Flower
Dichondra repens	Kidney Weed