## REVISION STATUS REGISTER

<table>
<thead>
<tr>
<th>Section/Page/Annexure</th>
<th>Revision</th>
<th>Amendment/Addition</th>
<th>Distribution</th>
<th>Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Version A</td>
<td>Original</td>
<td>DP&amp;I</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>Version B</td>
<td>Consultation</td>
<td>DP&amp;I</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>Version C</td>
<td>Consultation</td>
<td>OEH, NOW, GLC, CCC, DP&amp;I</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>Version D</td>
<td>Internal Review</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>RMP-E (00430451)</td>
<td>Edits made to: reflect amended Project Approval conditions by Order of The Land and Environment Court of NSW dated 10 November 2011; consider recommendations (where relevant) of the independent environmental audit dated November 2011; and consider any outcomes of the Annual Review for the Duralie Coal Mine (dated September 2011).</td>
<td>DP&amp;I, DTIRIS, CCC, GLC, NOW, OEH</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>RMP-F (00438467)</td>
<td>Edits made to address DP&amp;I comments.</td>
<td>DTIRIS</td>
<td>-</td>
</tr>
<tr>
<td>Section 5.3.2, 5.4.3, 5.4.7 and 9</td>
<td>RMP-G (00456778)</td>
<td>Edits made to address SEWPaC comments.</td>
<td>SEWPaC, DP&amp;I, DTIRIS</td>
<td>28 February 2013</td>
</tr>
<tr>
<td>All</td>
<td>RMP-H</td>
<td>Annual Review (2012)</td>
<td>DTIRIS</td>
<td>31 May 2013</td>
</tr>
<tr>
<td>All</td>
<td>RMP-I</td>
<td>Annual Review (2013) including recommendations from DP&amp;I Audit December 2013</td>
<td>DP&amp;E</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>RMP-J</td>
<td>Annual Review (2014) and Duralie Open Pit Modification (2014)</td>
<td>DRE</td>
<td></td>
</tr>
</tbody>
</table>

**MAY 2015**  
Project No. GCL-10-13  
Document No. RMP-J (676584)
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2 PURPOSE AND SCOPE</td>
<td>4</td>
</tr>
<tr>
<td>3 STATUTORY REQUIREMENTS</td>
<td>5</td>
</tr>
<tr>
<td>3.1 EP&amp;A ACT PROJECT APPROVAL</td>
<td>5</td>
</tr>
<tr>
<td>3.1.1 Rehabilitation Management Plan</td>
<td>5</td>
</tr>
<tr>
<td>3.1.2 General Management Plan Requirements</td>
<td>5</td>
</tr>
<tr>
<td>3.1.3 Progressive Rehabilitation</td>
<td>6</td>
</tr>
<tr>
<td>3.1.4 Rehabilitation Objectives</td>
<td>6</td>
</tr>
<tr>
<td>3.2 LICENCES, PERMITS AND LEASES</td>
<td>7</td>
</tr>
<tr>
<td>3.3 OTHER LEGISLATION AND GUIDELINES</td>
<td>8</td>
</tr>
<tr>
<td>4 CONSULTATION</td>
<td>10</td>
</tr>
<tr>
<td>5 DCM REHABILITATION</td>
<td>11</td>
</tr>
<tr>
<td>5.1 EXISTING (BASELINE) REHABILITATION STATUS</td>
<td>11</td>
</tr>
<tr>
<td>5.2 POST MINING LAND USE GOAL</td>
<td>11</td>
</tr>
<tr>
<td>5.3 REHABILITATION OBJECTIVES</td>
<td>11</td>
</tr>
<tr>
<td>5.3.1 Domain 1B – Infrastructure Areas (Woodland/Open Forest)</td>
<td>14</td>
</tr>
<tr>
<td>5.3.2 Domain 2A/2B – Water Management Area (Pasture/Scattered Trees or Woodland/Open Forest)</td>
<td>14</td>
</tr>
<tr>
<td>5.3.3 Domain 2C – Permanent Water Management Area</td>
<td>15</td>
</tr>
<tr>
<td>5.3.4 Domain 3A/3B – Waste Emplacement (Pasture/Scattered Trees or Woodland/Open Forest)</td>
<td>15</td>
</tr>
<tr>
<td>5.3.5 Domain 4D – Open Cut Pit (Final Void/Water Storage)</td>
<td>16</td>
</tr>
<tr>
<td>5.3.6 Domain 5E – Offset Areas</td>
<td>16</td>
</tr>
<tr>
<td>5.4 REHABILITATION CONCEPTS</td>
<td>16</td>
</tr>
<tr>
<td>5.4.1 Weismantel Extension and Clareval North West Open Pits</td>
<td>20</td>
</tr>
<tr>
<td>5.4.2 Waste Rock Emplacement</td>
<td>20</td>
</tr>
<tr>
<td>5.4.3 Coal Shaft Creek</td>
<td>22</td>
</tr>
<tr>
<td>5.4.4 Water Management Infrastructure</td>
<td>25</td>
</tr>
<tr>
<td>5.4.5 Site Infrastructure</td>
<td>25</td>
</tr>
<tr>
<td>5.4.6 Plant Species Selection</td>
<td>26</td>
</tr>
<tr>
<td>5.5 GENERAL REHABILITATION PRACTICES AND MEASURES</td>
<td>27</td>
</tr>
<tr>
<td>5.5.1 Vegetation Clearance Plan</td>
<td>27</td>
</tr>
<tr>
<td>5.5.2 Collecting and Propagating Seed</td>
<td>27</td>
</tr>
<tr>
<td>5.5.3 Salvaging and Reusing Material for Habitat Enhancement</td>
<td>27</td>
</tr>
<tr>
<td>5.5.4 Soil Stripping Areas and Handling Measures</td>
<td>28</td>
</tr>
<tr>
<td>5.5.5 Erosion and Sediment Control Works</td>
<td>28</td>
</tr>
<tr>
<td>5.5.6 Weed Control</td>
<td>28</td>
</tr>
<tr>
<td>5.5.7 Feral Pest Control</td>
<td>29</td>
</tr>
<tr>
<td>5.5.8 Bushfire Management</td>
<td>29</td>
</tr>
<tr>
<td>5.5.9 Controlling Vehicle Access</td>
<td>30</td>
</tr>
<tr>
<td>5.5.10 Landscaping</td>
<td>30</td>
</tr>
<tr>
<td>5.5.11 Site Contamination</td>
<td>30</td>
</tr>
<tr>
<td>5.6 INTEGRATION WITH THE OFFSET STRATEGY</td>
<td>30</td>
</tr>
<tr>
<td>6 REHABILITATION COMPLETION CRITERIA</td>
<td>31</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1 Management Plan Requirements
Table 2 Short-term, Medium-term and Long-term Rehabilitation Objectives
Table 3 Indicative Species Proposed for Native Revegetation
Table 4 Key Completion Criteria
Table 5 Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

LIST OF FIGURES

Figure 1 Regional Location
Figure 2 Aerial Photograph of the DCM Area and Surrounds
Figure 3 Conceptual Post-Rehabilitation – Final Landform and Domains
Figure 4 General Arrangement Post-Mining
Figure 5 Conceptual Sections of the Gloucester Basin Post-Mining
Figure 6 Cross-Section of Final Voids Post-Mining
Figure 7 Coal Shaft Creek Reconstruction (Typical Sections)

LIST OF APPENDICES

Appendix A Relevant Extracts from Mining Lease 1427 and Mining Lease 1646
1 INTRODUCTION

Duralie Coal Pty Ltd (DCPL), a wholly owned subsidiary of Yancoal Australia Limited, operates the Duralie Coal Mine (DCM). The DCM is situated adjacent to Mammy Johnsons River within the Karuah River Catchment, between the townships of Ward’s River and Stroud Road on the Bucketts Way in New South Wales (NSW) (Figure 1). The NSW Minister for Urban Affairs and Planning granted Development Consent for the DCM in August 1997 and coal production commenced in 2003.

The Duralie Extension Project involves the extension and continuation of mine operations at the DCM. DCPL was granted approval for the Duralie Extension Project under section 75J of the NSW Environmental Planning and Assessment Act, 1979 (EP&A Act) on 26 November 2010 (NSW Project Approval [08_0203]) and under sections 130 and 133 of the Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC) on 22 December 2010 (Commonwealth Approval [EPBC 2010/5396]). On 10 November 2011, the NSW Project Approval (08_0203) was amended by Order of The Land and Environment Court of NSW. On 1 November 2012, the NSW Project Approval (08_0203) was modified as a result of the Duralie Rail Hours Modification. On 5 December 2014, the NSW Project Approval (08_0203) was modified as a result of the Duralie Open Pit Modification. A copy of the consolidated NSW Project Approval (08_0203) and the Commonwealth Approval (EPBC 2010/5396) is available on the Duralie Coal website (http://www.duraliecoal.com.au).

The main activities associated with the Duralie Extension Project (as modified) include:

- continued development of open cut mining operations at the DCM to facilitate a total run-of-mine (ROM) coal production rate of up to approximately 3 million tonnes per annum (Mtpa), including:
  - extension of the existing approved open pit in the Weismantel Seam to the north-west (i.e. Weismantel open pit) within Mining Lease (ML) 1427 and ML 1646; and
  - open cut mining operations in the Clareval Seam (i.e. Clareval open pit) within ML 1427 and ML 1646;
- ongoing exploration activities within existing exploration tenements;
- progressive backfilling of the open pits with waste rock as mining develops, and continued and expanded placement of waste rock in out-of-pit waste rock emplacements;
- increased ROM coal rail transport movements on the North Coast Railway between the DCM and the Stratford Coal Mine (SCM) in line with increased ROM coal production;
- continued disposal of excess water through irrigation (including development of new irrigation areas within the existing ML 1427 and ML 1646);
- construction of Auxiliary Dam No.2 to relative level (RL) 100 metres (m) to provide 2,900 megalitres of on-site storage capacity to manage excess water on-site;
- progressive development of dewatering bores, pumps, dams, irrigation infrastructure and other water management equipment and structures;
- development of new haul roads and internal roads;
- upgrade of existing surface facilities and supporting infrastructure as required in line with increased ROM coal production;
- continued development of soil stockpiles, laydown areas and gravel/borrow pits;
- establishment of the permanent Coal Shaft Creek Diversion alignment adjacent to the existing DCM mining area;
- ongoing monitoring and rehabilitation; and
- other associated minor infrastructure, plant, equipment and activities.

The approved general arrangement of the DCM is presented in Figure 2.
2 PURPOSE AND SCOPE

This Rehabilitation Management Plan (RMP) has been prepared by DCPL in accordance with Condition 57, Schedule 3 of the NSW Project Approval (08_0203).

This revision of the RMP has been prepared by DCPL to:

- consider the outcomes of the 2013 and 2014 Annual Reviews for the Duralie Coal Mine (submitted October 2013 and August 2014, respectively);
- consider the recommendations from the Department of Planning & Environment (DP&E) Compliance Audit completed on 6 December 2013;
- incorporate changes associated with the Duralie Open Pit Modification.

The objectives of this RMP are to fulfil the relevant consent conditions by providing:

- rehabilitation objectives for the DCM;
- a description of the measures and procedures that will be implemented to progressively rehabilitate the DCM and manage the remnant vegetation and habitat of the DCM;
- key completion criteria for rehabilitation at the DCM;
- a programme to monitor the effectiveness of measures and procedures and progress against the performance and completion criteria; and
- details of responsibilities for the implementation, monitoring and review of this RMP.
3 STATUTORY REQUIREMENTS

DCPL’s statutory obligations are contained in:

(i) the conditions of the NSW Project Approval (08_0203);
(ii) the conditions of the Commonwealth Approval (EPBC 2010/5396);
(iii) relevant licences and permits, including conditions attached to mining leases; and
(iv) other relevant legislation.

Obligations relevant to this RMP are described below.

3.1 EP&A ACT PROJECT APPROVAL

The conditions of the NSW Project Approval relevant to rehabilitation are described below.

3.1.1 Rehabilitation Management Plan

Condition 57, Schedule 3 of the NSW Project Approval requires the preparation of a RMP. Condition 57 states:

57. The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of the Secretary of DTIRIS. This plan must:

(a) be prepared in consultation with the Department, OEH, NOW, Council and the CCC;
(b) be prepared in accordance with any relevant DRE guideline;
(c) build, to the maximum extent practicable, on the other management plans required under this approval;
(c1) address all aspects of mine closure and rehabilitation, including post mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management;
(d) provide for scientific knowledge gained during the rehabilitation, to be made publicly available; and
(e) be submitted to the Secretary of DTIRIS for approval within 3 months of the date of this approval, unless otherwise agreed by the Secretary

3.1.2 General Management Plan Requirements

Condition 2, Schedule 5 of the NSW Project Approval outlines the management plan requirements that are applicable to the preparation of the RMP. Table 1 presents these requirements and indicates where they are addressed within this RMP.
Table 1
Management Plan Requirements

<table>
<thead>
<tr>
<th>NSW Project Approval Condition</th>
<th>RMP Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:</td>
<td>Section 5.1</td>
</tr>
<tr>
<td>a) detailed baseline data;</td>
<td>Section 3</td>
</tr>
<tr>
<td>b) a description of:</td>
<td>Section 6</td>
</tr>
<tr>
<td>• the relevant statutory requirements (including any relevant approval, licence or lease conditions);</td>
<td>Section 6</td>
</tr>
<tr>
<td>• any relevant limits or performance measures/criteria;</td>
<td>Section 5</td>
</tr>
<tr>
<td>• 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;</td>
<td>Sections 7 and 10</td>
</tr>
<tr>
<td>c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</td>
<td>Section 8</td>
</tr>
<tr>
<td>d) a program to monitor and report on the:</td>
<td>Section 10</td>
</tr>
<tr>
<td>• impacts and environmental performance of the project;</td>
<td>Section 10</td>
</tr>
<tr>
<td>• effectiveness of any management measures (see (c) above);</td>
<td>Section 8</td>
</tr>
<tr>
<td>e) a contingency plan to manage any unpredicted impacts and their consequences;</td>
<td>Section 10</td>
</tr>
<tr>
<td>f) a program to investigate and implement ways to improve the environmental performance of the project over time;</td>
<td>Section 10</td>
</tr>
<tr>
<td>g) a protocol for managing and reporting any;</td>
<td>Section 10</td>
</tr>
<tr>
<td>• incidents;</td>
<td>Section 10</td>
</tr>
<tr>
<td>• complaints;</td>
<td>Section 10</td>
</tr>
<tr>
<td>• non-compliances with statutory requirements; and</td>
<td>Section 10</td>
</tr>
<tr>
<td>• exceedences of the impact assessment criteria and/or performance criteria; and</td>
<td>Section 10</td>
</tr>
<tr>
<td>h) a protocol for periodic review of the plan.</td>
<td>Section 10</td>
</tr>
</tbody>
</table>

3.1.3 Progressive Rehabilitation

Condition 56, Schedule 3 of the NSW Project Approval requires rehabilitation to be conducted progressively at the DCM. Condition 56 states:

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

3.1.4 Rehabilitation Objectives

Condition 55, Schedule 3 of the NSW Project Approval outlines rehabilitation objectives that are applicable to DCM. Condition 55 states:

55. The Proponent shall rehabilitate the site to the satisfaction of the Secretary of DTIRIS. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (and depicted conceptually in the figures in Appendix 7), and comply with the objectives in Table 12.
### Table 12: Rehabilitation Objectives

<table>
<thead>
<tr>
<th>Feature</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine site (as a whole of the disturbed land and water)</td>
<td>Safe, stable &amp; non-polluting, fit for the purpose of the intended post-mining land use(s).</td>
</tr>
<tr>
<td>Surface infrastructure</td>
<td>To be decommissioned and removed, unless the Secretary agrees otherwise.</td>
</tr>
<tr>
<td>Coal Shaft Creek Diversion</td>
<td>Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining.</td>
</tr>
<tr>
<td>Landforms</td>
<td>Final landforms sustain the intended land use for the post-mining domain(s).  Final landforms are consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post-mining landscape. Final landforms incorporate design relief patterns and principles for consistent with natural drainage.</td>
</tr>
<tr>
<td>Other land affected by the project</td>
<td>Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of:</td>
</tr>
<tr>
<td></td>
<td>• local native plant species; and</td>
</tr>
<tr>
<td></td>
<td>• a landform consistent with the surrounding environment.</td>
</tr>
<tr>
<td>Water quality</td>
<td>Water retained on site is fit for the intended land use(s) for the post-mining domain(s).</td>
</tr>
<tr>
<td></td>
<td>Water discharged from site is consistent with the baseline ecological, hydrological and geomorphic conditions of the creeks prior to mining disturbance. Water management is consistent with the regional catchment management strategy.</td>
</tr>
<tr>
<td>Native flora and fauna habitat and corridors</td>
<td>Size, locations and species of native tree lots and corridors are established to sustain biodiversity habitats. Species are selected that re-establishes and complements regional and local biodiversity.</td>
</tr>
<tr>
<td>Final Void</td>
<td>Safe, stable and non-polluting</td>
</tr>
<tr>
<td>Post-mining agricultural pursuits</td>
<td>The land capability classification for the relevant nominated agricultural pursuit for each domain is established and self-sustaining within 5 years of land use establishment (first planting of vegetation).</td>
</tr>
<tr>
<td>Community</td>
<td>Minimise the adverse socio-economic effects associated with mine closure</td>
</tr>
</tbody>
</table>

### 3.2 LICENCES, PERMITS AND LEASES

In addition to the NSW Project Approval (08_0203) and Commonwealth Approval (EPBC 2010/5396), all activities at the DCM will be conducted in accordance with a number of licences, permits and leases which have been issued or are pending issue.

Key licences, permits and leases pertaining to the DCM include:

- ML 1427 issued under Part 5 of the NSW *Mining Act, 1992* and approved by the NSW Minister for Mineral Resources in April 1998.
- ML 1646 issued under Part 5 of the NSW *Mining Act, 1992* and approved by the NSW Minister for Primary Industries in January 2011.

• NSW Office of Water Bore Licence for monitoring bores WR1, WR2 and DB11W (20BL173570, 20BL173568, 20BL173569) dated 5 August 2013.

• Mining Operations Plan (MOP) approved by the Department of Trade and Investment, Regional Infrastructure and Services [DTIRIS] on 18 March 2015.

• Water Supply Works Approval (20WA202053) under the NSW Water Management Act, 2000 issued by the Department of Water and Energy (now NSW Office of Water) on 15 May 2009 for the Coal Shaft Creek diversion and various on site water management structures.

• Mining and occupational health and safety related approvals granted by DTIRIS and WorkCover NSW.

ML 1427 and ML 1646 conditions have been reviewed and the conditions are applicable to the RMP are presented in Appendix A.

3.3 OTHER LEGISLATION AND GUIDELINES

DCPL will conduct the DCM consistent with the NSW Project Approval (08_0203), the Commonwealth Approval (EPBC 2010/5396) and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act.

In addition to those Acts referred to above (Section 3.2), the NSW Acts, Regulations and Guidelines applicable to the RMP include, but are not limited to, the:

• Contaminated Land Management Act, 1997.
• Dangerous Goods Act (Roads and Rail Transport), 2008.
• Mining Act, 1992.
• Rail Safety Act, 2008.
• Threatened Species Conservation Act, 1995.
• Water Act, 1912.
• Water Management Act, 2000.
• Local Government Act 1993.

1 This approval replaced the previous Water Act, 1912 Licence 20SL060324 for these structures.
• Guidelines to the Mining, Rehabilitation and Environmental Management Process (MREMP Guidelines) (NSW Department of Trade and Investment, undated).

• Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation (Department of Industry, Tourism and Resources [DITR], 2006).

A summary of the guidelines listed above is provided below.

**Draft NSW Biodiversity Strategy 2010 – 2015**

In 1999, the NSW Government produced the State’s first Biodiversity Strategy, *NSW Biodiversity Strategy 1999 – 2003* (NSW National Parks and Wildlife Service, 1999). Subsequent to the development of the NSW State Plan, *A New Direction for NSW* (NSW Government, 2006), a discussion paper, *A New Biodiversity Strategy for New South Wales: Discussion Paper* (NSW Department of Environment and Climate Change, 2008), was prepared. From this paper a Draft Biodiversity Strategy was prepared. This Draft Biodiversity Strategy identifies important new initiatives and a redirection of current efforts that will target investment in terrestrial, aquatic and marine programs for the next five years and the need to promote the integration of biodiversity conservation into decision-making at all levels of government, industry and the community, and across the whole landscape.

This RMP has been prepared in consideration of the Draft Biodiversity Strategy. The draft NSW Biodiversity Strategy is consistent with the vision and directions contained in *The Department of Sustainability, Environment, Water Population and Communities’ Australia’s Biodiversity Conservation Strategy 2010–2030* (Department of Sustainability, Environment, Water Population and Communities’ [SEWPaC], 2010) and this document will also, upon finalisation, be considered in subsequent revisions of this RMP.

**Guidelines to the Mining, Rehabilitation and Environmental Management Process**

The NSW Department of Trade and Investment’s (undated) MREMP Guideline describes the mining, rehabilitation and environmental management process to ensure the satisfactory environmental and rehabilitation performance of mines in NSW. It provides an acceptable format for the preparation of MOPs and Annual Environmental Management Reports for mines.

The guideline introduces the MREMP Guideline required by the NSW Department of Trade and Investment. It describes:

• the approval process which enables mining in NSW;
• the role of the lease holder in preparing and lodging MOPs and Annual Environmental Management Reports; and
• the manner in which the NSW Department of Trade and Investment responds to the documents lodged.

**Leading Practice Sustainable Development Program for the Mining Industry**

The *Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation* (DITR, 2006) was used to guide rehabilitation concepts for the DCM. The handbook has a sustainable development focus and the handbook outlines the principles and leading practices of mine rehabilitation, with emphasis on land form design and revegetation. Subjects include rehabilitation objectives, soil handling, earthworks, revegetation, soil nutrients, fauna return, maintenance, success criteria and monitoring. Particular emphasis is given to the restoration of natural ecosystems, especially the re-establishment of native flora.
4 CONSULTATION

For the purpose of this RMP, relevant stakeholders are considered to include the DP&E, Department of Resources and Energy (DRE), OEH, NSW Office of Water, Great Lakes Council and the DCM Community Consultative Committee.

DCPL will consult with these and any other relevant stakeholders over the life of the DCM to ensure the best possible overall rehabilitation outcome.
5 DCM REHABILITATION

5.1 EXISTING (BASELINE) REHABILITATION STATUS

A summary of rehabilitation status and the rehabilitation activities conducted at the DCM is provided each year in the Annual Reviews which are available on the Duralie Coal website (www.duraliecoal.com.au).

5.2 POST MINING LAND USE GOAL

The mine closure goal for the DCM is to achieve relinquishment to the satisfaction of the relevant Minister(s), meeting relevant ML and Project Approval conditions.

Rehabilitation of mined lands will be considered suitable when the nominated standards and/or completion criteria for land use, landform stability, revegetation, and beneficial use have been met, or if the relevant Minister(s) otherwise accepts the rehabilitation status.

The post-mining land uses at the DCM include:

- pasture and scattered trees;
- woodland/open forest;
- permanent water management area; and
- final void/water storage.

Table 2 describes the general rehabilitation and mine closure goals for the DCM. Figure 3 shows the proposed post-mining land use for each rehabilitation domain (based on the ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 [DTIRIS-DRE, 2013]).

5.3 REHABILITATION OBJECTIVES

Rehabilitation objectives have been developed for each domain based on relevant Project Approval and ML conditions and the rehabilitation objectives presented in the Duralie Open Pit Modification.

The overall rehabilitation objectives and domain rehabilitation objectives of the DCM will ultimately be subject to consultation with relevant regulatory authorities (e.g. DTIRIS-DRE, DP&E, OEH, NSW Office of Water and Great Lakes Council) and key stakeholders including surrounding landholders and the DCM Community Consultative Committee.
Table 2 describes short-term, medium-term and long-term objectives that describe how the DCM will be progressively rehabilitated and integrated into the landscape. Table 2 also includes relevant DCM management plans that will assist obtain the objectives.

**Table 2**

**Short-term, Medium-term and Long-term Rehabilitation Objectives**

<table>
<thead>
<tr>
<th>Short-term Objectives</th>
<th>Medium-term Objectives</th>
<th>Long-term Objectives</th>
<th>Relevant Management Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Minimisation of disturbance areas.</td>
<td>• Creation of landforms which are geotechnically stable and visually consistent with the surrounding environment.</td>
<td>• Creation of landforms which are geotechnically stable and visually consistent with the surrounding environment.</td>
<td>• Environmental Management Strategy.</td>
</tr>
<tr>
<td>• Conservation of sufficient soil resources for rehabilitation via appropriate soil management.</td>
<td>• Minimisation of erosion through the design and construction of contour drainage and additional sediment control dams.</td>
<td>• Creation of final land use of grazing and woodland habitat.</td>
<td>• Water Management Plan (including site water balance, surface water management plan (including Coal Shaft Creek Reconstruction Plan) and groundwater management plan).</td>
</tr>
<tr>
<td>• Provision of sediment control measures.</td>
<td>• Appropriate selection of tree and pasture species for progressive rehabilitation.</td>
<td>• Reconstruction of Coal Shaft Creek using design principles which provide for long-term stability including a stable vegetative covering.</td>
<td>• Biodiversity Management Plan (including Offset Strategy).</td>
</tr>
<tr>
<td>• Rapid stabilisation of newly constructed infrastructure by topsoiling, seeding and fertilising.</td>
<td>• Encouragement of seed propagation through placement of topsoil, utilisation of soil ameliorants as required (e.g. gypsum, lime), seeding and fertilising.</td>
<td>• Management of cattle through fencing to allow controlled grazing within particular rehabilitated areas.</td>
<td>• Giant Barred Frog Management Plan (including summary of Giant Barred Frog Study).</td>
</tr>
<tr>
<td>• Appropriate waste rock management including delineation and controlled placement of rock wastes on the basis of acid forming potential.</td>
<td>• Evaluation of availability of soil resources for rehabilitation completion by routinely calculating a soil balance.</td>
<td>• Provision of access tracks for light vehicles, tractors, etc.</td>
<td>• Waste Management Plan.</td>
</tr>
<tr>
<td>• Recovery of items suitable for providing alternative habitat for displaced fauna (e.g. tree hollows).</td>
<td>• Improvement of habitat in rehabilitated areas through noxious weed management, feral animal control and restriction of cattle and vehicle access.</td>
<td>• Retention of water management infrastructure for use as agreed with the relevant landholders.</td>
<td></td>
</tr>
<tr>
<td>• Progressive backfilling of the open pit.</td>
<td>• Revegetation monitoring with remediation where monitoring indicates the need.</td>
<td>• Decommissioning of sediment control structures if they are no longer serving an ancillary purpose (e.g. stock watering).</td>
<td></td>
</tr>
<tr>
<td>• Direct placement of topsoil resources where areas on the waste rock emplacement are available for topsoil application.</td>
<td></td>
<td>• Gradual removal and decommissioning of redundant site infrastructure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maintenance of the quality of surface water runoff to appropriate standards.</td>
<td>• Revegetation monitoring with remediation where monitoring indicates the need.</td>
<td></td>
</tr>
</tbody>
</table>
5.3.1 Domain 1B – Infrastructure Areas (Woodland/Open Forest)

The infrastructure areas at the DCM will comprise (Figure 2):

- rail loading infrastructure and Workshop; and
- internal haul roads.

**Rail Loading Infrastructure and Workshop**

Post-operations, the key rehabilitation objectives for the infrastructure areas are to:

- Decommission and remove all infrastructure, unless otherwise agreed by the determining authority (e.g. decommissioning of the rail siding).
- If there are any contaminated soils associated with the site workshops or contaminated sediments in the return water dam, these will be identified and remediated in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997*.
- Deep rip areas as required and topsoil all areas.
- Revegetate the domain to woodland/open forest.

If at the time of mine closure, the determining authority requires the decommissioning of the rail siding, DCPL will rehabilitate this area as follows:

- removal of line and signalling infrastructure;
- identify any contaminated soils associated in the rail siding area and remediate in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997*;
- profile to a free-draining landform; and
- revegetate the area to woodland/open forest.

**Haul Roads**

Consistent with the *Duralie Extension Project Environmental Assessment* (DCPL, 2010) and Duralie Open Pit Modification, at the completion of mining the DCM haul roads will be decommissioned, reporfiled or removed where required, topsoiled and revegetated with woodland and open forest unless otherwise agreed by the determining authority (e.g. retained for agricultural use).

5.3.2 Domain 2A/2B – Water Management Area (Pasture/Scattered Trees or Woodland/Open Forest)

Minor water management structures and sediment control dams will be decommissioned and rehabilitated or retained as farm water dams in consultation with landholders.

Sediment dams downstream of the waste rock emplacements will be maintained until the revegetated surface is stable and the runoff water quality is suitable for release off-site. The stability of the landform will be determined by rehabilitation monitoring (Section 7).
5.3.3 Domain 2C – Permanent Water Management Area

The following water management structures for the DCM will be retained for future agricultural use and environmental benefit (Figure 2):

- Main Water Dam;
- Auxiliary Dam No.1;
- Auxiliary Dam No. 2;
- Coal Shaft Creek diversion; and
- other water management structures.

The rehabilitation objective for the permanent water management structures is to create safe, stable and non-polluting systems which retain water fit for post mining land use(s).

*Up-catchment Diversions*

A number of up-catchment diversions will be permanent structures that would remain post-mining (e.g. the up-catchment diversions for the Duralie Waste Emplacement that reports to the Duralie East Dam).

*Other Water Management Structures*

A number of permanent drop down structures will be retained post-mining (e.g. on the batters of waste rock emplacements).

The drop down structures will be designed so that they are safe, stable, non-polluting in the long-term and such that such that water retained on-site will be of a form that is of fit for use on post mining domains. The stability of the drop down structures will be determined by qualified engineering design and geotechnical assessment (Section 6).

5.3.4 Domain 3A/3B – Waste Emplacement (Pasture/Scattered Trees or Woodland/Open Forest)

In general, rehabilitation of the waste emplacements involves reshaping of the waste material to maximise stability and reduce erosion, spreading of soil substrates where required, revegetation and ongoing monitoring and management.

The majority of the upper surface of the Waste Emplacement will be rehabilitated to endemic woodland/open forest species as shown on Figure 3.

Some of the upper areas of the Waste Emplacement will be revegetated to pasture with scattered trees as shown on Figure 3. These areas will target stocking rates between 1.5 to 4.0 DSE per hectare.

The progression of rehabilitated areas will however be determined by rehabilitation monitoring results (Section 7).

---

2 The water management structures would be retained unless agreed otherwise with DTIRIS-DRE, Dam Safety Committee and relevant future landholders.
5.3.5 Domain 4D – Open Cut Pit (Final Void/Water Storage)

The DCM final landform will include partially backfilled final voids located at the Weismantel pit and Clareval pit (Figure 4). The rehabilitation objectives for these final voids are to:

- minimise the catchment area of the final voids;
- provide a stable long-term structure; and
- leave the void surrounds safe and secure (for humans and stray stock).

At the completion of mining, the final voids will be surrounded by pasture and scattered trees (Figure 3).

Final landform general arrangement and cross sections are shown on Figure 4 to Figure 6.

5.3.6 Domain 5E – Offset Areas

**Offset Areas**

The biodiversity offset strategy for the DCM involves conserving areas of land with existing conservation values and providing active management to maintain and enhance their values. The Offset Areas consist of two biodiversity offset areas (Figure 3). Within the biodiversity offset areas, existing native vegetation communities would be enhanced (approximately 299 ha), cleared land would be revegetated (approximately 357.5 ha).

The majority of the Offset Areas are located outside of the MLs (Figure 3).

5.4 REHABILITATION CONCEPTS

At the completion of mining the key final landforms and features at the DCM will include the following:

- Weismantel Extension and Clareval North West open pit voids;
- integrated in-pit and out-of-pit waste rock emplacement landform;
- reconstructed Coal Shaft Creek;
- water management infrastructure; and
- site infrastructure areas (e.g. administration and workshop buildings).

The conceptual final landform (including post mining land use domains) and offset areas are shown on Figure 3.

This section summarises the rehabilitation concepts for these key mine landforms, and the details of the planned rehabilitation concepts for each landform.
LEGEND

Section of Figure 4

Background Topography of Section (to approximately 4 km)

Section A - A¹ (Looking South-East)
(Refer to Figure 4)

Section B - B¹ (Looking South-West)
(Refer to Figure 4)

Source: Marc & Co (2014)
Approximate Pre-mining Ground Level

Weismantel Seams

Cheer-up Seams

Duralie Seams

Source: DCPL (2014)

FIGURE 6
Cross-Section of Final Voids Post-Mining
5.4.1 Weismantel Extension and Clareval North West Open Pits

At the cessation of mining, final voids will remain in the Clareval and Weismantel open pits. The location of the two voids is shown on Figure 4.

Following cessation of Clareval open pit mining activities, the remaining final void will be used to store mine water. Following the completion of mining activities at the DCM, it will be expected that the Clareval final void will continue to fill until an equilibrium level is reached.

Similar to the Clareval open pit, the Weismantel open pit will be progressively backfilled with waste rock as the open pit is developed, with a final void remaining to the north. The integrated final rehabilitated landform is shown on Figure 4 and comprises the abovementioned final voids, and the rehabilitated backfilled open pits integrated with rehabilitated out-of-pit waste rock emplacements.

A final void water balance model (Gilbert & Associates, 2014) was developed for the combined final voids to predict the long-term behaviour of the final void pit lake. The results of the water balance for the final voids indicate that the voids will slowly fill over time. Water levels will stabilise after about 80 years at a level approximately 14 m below spill level (88 metres Australian Height Datum [m AHD]) (Gilbert & Associates, 2014).

The following rehabilitation activities will be undertaken for the final voids:

- restriction of access via perimeter bunding, fencing and installation of signage;
- a geotechnical assessment will be undertaken to assess geotechnical stability and provide recommendations for the reshaping of final highwalls and endwalls; and
- vegetation screens will be established at strategic locations to provide visual screening and additional access control.

5.4.2 Waste Rock Emplacement

Mined waste rock at the DCM is placed in the waste rock emplacement. The final landform will consist of integrated in-pit and out-of-pit waste rock emplacements. The maximum height of the waste rock emplacement will be approximately 135 m AHD (i.e. similar scale to the existing Tombstone Hill) and include visible relief patterns and principles which are consistent with natural drainage, where practicable. Figure 6 provides a cross-section showing the integration of the backfilled Weismantel Extension open pit and out-of-pit waste rock emplacement.

Waste rock at DCM will be predominantly non-acid forming, with some potentially acid forming (PAF) material located mainly near the coal seam (Environment Geochemistry International, 2009).

The closure concept and rehabilitation strategy for the waste rock emplacement for the DCM involves:

- management of PAF material in accordance with existing site practices (i.e. encapsulation within cells of low permeability material or placement of PAF material below the post-mining groundwater table);
- grading the final surface of the waste rock emplacement to blend in with the natural topography of the area, with an overall outer batter slope of 1 vertical (V):4 horizontal (H);
- maintenance of operational erosion and sediment controls until establishment of stable final landforms;
- installation of drainage works (e.g. contour drains a longitudinal grade 1% flattening to 0.6%) and ponds to channel runoff safely to constructed outlet areas; and
• progressive rehabilitation of outer batters.

In accordance with the recommendations of the independent environmental audit (Trevor Brown & Associates, 2011), the slope of the final surface of the waste rock emplacement will adopt a concave profile (rather than batters and benches) where practicable.

**Water Management**

The top surface of the waste rock emplacement will be designed as an extension of Tombstone Hill and will generally drain towards the south to Coal Shaft Creek. Rock-lined channels will be installed along the edge of the top surface to provide a stable means for surface water runoff to drain from the top of the waste rock emplacement (Woodward-Clyde, 1996).

Surface water runoff on the batters of the waste rock emplacement will flow perpendicularly down the slope to the toe of each batter where it will be re-directed by contour drains. The slope length of the rehabilitated waste rock emplacements will constructed in accordance with *Managing urban storm water – Soils and Construction Volume 1* (Landcom, 2004) as recommended by the independent environmental audit (Trevor Brown & Associates, 2011). The contour drains will be grass-lined, and will flow to the natural ground surface. Hydraulic control structures will be constructed to minimise erosion potential down the slope to the existing ground level (Woodward-Clyde, 1996).

As part of development of the waste rock emplacement, waste rock will be placed against the Tombstone Hill ridgeline to the east of the waste rock emplacement area. In the northern portion of the waste rock emplacement, drainage from the eastern batter of the waste rock emplacement will drain eastwards towards Mammy Johnsons River.

Rock-lined channels (or other appropriate erosion control treatment) will be used at the base of the waste rock emplacement to direct runoff into natural creek lines (e.g. Coal Shaft Creek).

Sediment dams downstream of the waste rock emplacements will be maintained until the revegetated surface is stable and the runoff water quality is suitable for release off-site.

Monthly monitoring data from sediment dams will be compared with values of two similarly sized control catchments with similar post-mine land use intensity outside the DCM area. Examples of runoff water quality will be considered suitable for release off site when the median runoff water quality for 24 months of data is within 10% of the median values of the two control catchments and 25% of the 80th percentile for electrical conductivity, pH and Total Suspended Solids, and within 25% of the 20th percentile for pH.

In the long-term, it is possible that seepage of groundwater may occur from the rehabilitated waste rock emplacement. To prevent movement of undiluted water to Mammy Johnsons River during the recession of runoff events, clay cut-off walls will be constructed along the southern end of the toe of the waste rock emplacement at the invert of the original Coal Shaft Creek channel and the main drainage channel and its banks will be engineered to reduce direct seepage out of the waste rock emplacement to negligible levels. These works will be undertaken in conjunction with the reconstruction of Coal Shaft Creek.

3 Control catchments under consideration include Coal Shaft Creek (pre-mine and post-mine up-catchment of the DCM), Avondale Creek (pre-mine and post-mine up-catchment of Stratford Mining Complex) and/or other adjacent catchments subject to availability of data (e.g. tributaries east of Mammy Johnsons River, Chainy Flat Creek and Coal Creek).
The post-mining water management strategy is shown on Figure 4.

**Revegetation**

The revegetation objective for the waste rock emplacement will be to provide areas of woodland and pasture on the waste rock emplacement surface and batters. The woodland areas will be linked to a broader habitat enhancement strategy. In addition, trees will be established around the perimeter of the reprofiled waste rock emplacement to facilitate screening of potential views of the DCM.

An irrigation system has been installed on the existing rehabilitated areas on the waste rock emplacement. This system will be extended as rehabilitation progresses to the north over the life of the DCM. It is anticipated that irrigation will assist with the early establishment of sown pasture and trees on rehabilitated areas.

As vegetation on rehabilitated areas becomes mature, the irrigation will be managed to allow vegetation to adjust to the natural rainfall regime that it will encounter after the irrigation is ceased following mine closure. Replacement of trees and fertilisation of rehabilitated areas will be undertaken should vegetation monitoring indicate the need.

Similarly, prolonged irrigation of mine water has the potential to elevate salinity levels in the rehabilitated waste rock emplacement. The Irrigation Monitoring Program is described in the Water Management Plan and includes visual monitoring of irrigation areas and vegetation monitoring to identify potential adverse impacts of irrigation (e.g. salinity) on vegetation. Where effects such as dieback or loss of vigour are recorded, appropriate management measures will be put in-place e.g. temporary cessation of irrigation on a particular impacted (e.g. by active erosion or signs of leaf scorching) area, as described in the Water Management Plan.

### 5.4.3 Coal Shaft Creek

The proposed design for the post-mining alignment of Coal Shaft Creek will comprise a reworked section of the existing Coal Shaft Creek diversion channel, a drop-down section outside the in-pit waste rock emplacement, and a reconstruction of the creek within a corridor over the in-pit waste rock emplacement at the southern end of the Weismantel open pit extent (Figure 4).

Throughout the DCM life, analyses will be conducted into the geotechnical, hydrological and hydraulic design of the final alignment focusing on long-term stability, seepage management and the creation of habitat. The outcomes of these analyses will inform the final detailed design of the post-mining alignment and reconstruction of Coal Shaft Creek.

The final design of the post-mining alignment of the Coal Shaft Creek is documented in the Coal Shaft Creek Reconstruction Plan in accordance with Condition 29(b), Schedule 3 of the NSW Project Approval. The Coal Shaft Creek Reconstruction Plan is included as an attachment of the Surface Water Management Plan (Appendix B of the Water Management Plan). A description of the components of the proposed design for the reconstructed Coal Shaft Creek is provided below.

The upper section of the Coal Shaft Creek diversion will be retained as a primarily engineered structure, however sediments and vegetation (in addition to existing vegetation) will establish within the channel over time. The banks of the diversion will continue to be revegetated throughout the mine life and following the completion of mining to enhance stability and create fauna habitat.
A drop-down section, to lower the level of the diversion by approximately 20 m, will be constructed between the reworked section of the existing Coal Shaft Creek diversion channel and the re-established alignment over the in-pit waste rock emplacement. The drop-down section will be constructed from the diversion channel through the ridgeline north of the Mine Water Dam. The aim will be for excavation into hard rock to facilitate long-term stability and to minimise ongoing maintenance. Monitoring of the drop-down section will be conducted and where results indicate the need, relevant maintenance will be undertaken (Gilbert & Associates, 2010).

DCPL will undertake a study into the long-term geotechnical stability and maintenance requirements of the proposed drop-down section of the reconstructed Coal Shaft Creek. The results of this study will be incorporated into the final design and post-mining alignment of the reconstructed Coal Shaft Creek as a component of the Water Management Plan.

The final alignment of Coal Shaft Creek over the in-pit waste rock emplacement will be designed and constructed within the corridor shown on Figure 4. The creek will be designed with a meandering channel within a 50 m wide reconstruction corridor, which will generally replicate the original meandering geometry. In general accordance with Maintenance of Geomorphic Processes in Bowen Basin River Diversions - Stage 1, Australian Coal Association Research Program Project C8030 (ID&A Pty Ltd, 2000), the reconstructed creek design will aim to generally mimic pre-mining (surveyed) creek cross-sections and adopt a design with a “main” flow channel, with overbank areas for large flows, with the main channel sized similar to the pre-mining creek capacity (Figure 7).

The channel will include an engineered low permeability zone (e.g. clay liner) (Figure 7) which will restrict the movement of water between Coal Shaft Creek and the waste rock emplacement (Gilbert & Associates, 2010).

Whilst the design concepts for the re-establishment of the creek over the in-pit waste emplacement are based on mimicking the natural creek, the reconstructed creek is expected to be dynamic and will evolve into a more natural system over time. This will inevitably result in preferential erosion and deposition in some sections which may (depending on the pattern of flows experienced post-commissioning) be initially greater than might be expected in the natural creek. Selection of final form and alignment will be subject to a detailed hydraulic analysis, as part of final design, together with an assessment of the likelihood of bed/bank erosion on the outside of bends under a range of flow conditions (Gilbert & Associates, 2010).

The conceptual longitudinal channel profile will also include habitat creation initiatives such as the provision of irregular pool and riffle sequences, use of material recovered from the existing channel or some other suitable source, placement of large boulders and/or timber to form pools upstream and promote aquatic habitat and planting of riverine vegetation on banks to enhance stability (Gilbert & Associates, 2010).
50m (Channel Corridor)

Base of Pit Excavation

Top of Clay Liner*

Clay Liner (Minimum Thickness 0.9m)
Constructed Using Clay Fill

Engineered Fill

Depth Varies

Backfill and Waste Rock

Over Bank (Outside Bend)

Over Bank (Inside Bend)

Armouring

Stream Bed Backfill

Typical Channel Corridor Section

Typical Section - Reconstructed Creek (Bend)

Typical Section - Reconstructed Creek (Straight)


*Channel Corridor Clay Liner to extend up batters to RL 55m or 3m (min) vertically from corridor invert (whichever is greater).
The channel will be formed progressively from south to north and creek flows will not be reinstated until the completion of mining and/or when vegetation was well established throughout. In concept, the creek will be constructed by (Gilbert & Associates, 2010):

- forming the 50 m wide reconstruction corridor in the waste rock material;
- constructing the clay liner to control leakage from the reconstructed creek to the waste rock and seepage from the waste rock emplacement to the creek;
- forming the channel and banks using material recovered from the existing channel or some other suitable source;
- placement of large boulders and/or timber to form pools upstream and promote aquatic habitat; and
- planting of riverine vegetation on the banks to enhance stability.

5.4.4 Water Management Infrastructure

In consultation with the regulatory authorities and the community, and considering the Karuah River Catchment Action Plan (Great Lakes Council, 2015), future local and regional water infrastructure needs, site water dams (e.g. Mine Water Dam, auxiliary dams) and accompanying upstream diversion structures may be retained for future use. The final uses of the water storages will be addressed through the MREMP framework (i.e. MOP and Annual Review).

Sediment dams will remain pending long-term acceptable water quality and may be kept for stockwater if suitable.

Irrigation infrastructure owned by DCPL will be decommissioned and sold, unless used for post-mining agricultural use.

5.4.5 Site Infrastructure

The existing infrastructure and services at the DCM will continue to be utilised throughout the life of the DCM, with minor additions, upgrades and maintenance works undertaken as required.

Infrastructure located at the DCM that will be removed at the end of the DCM life will include:

- workshop buildings and stores⁴;
- heavy vehicle servicing, parking and washdown facilities;
- sewage treatment facilities; and
- dangerous goods storage facilities.

During the decommissioning phase, the priority will be to dismantle fixed equipment and infrastructure for removal from site and re-use at another location or recycling. Non-salvageable/non-recyclable and non-contaminated infrastructure will be disposed of at suitable off-site disposal areas (or on-site subject to relevant approvals being obtained). Once all the equipment and infrastructure components have been removed from an area it will be deep ripped, topsoiled and seeded.

⁴ Some buildings and stores may be retained if required for post-mine land use.
Some concrete hardstands, administration and ablution buildings, site access roads, sheds, buildings and sediment dams may be retained for alternate post-mining uses. Electricity transmission infrastructure will be retained for future use by landholders unless it is no longer required, in which case it will be decommissioned and removed. The rail siding may also be retained for future infrastructure use if required by relevant stakeholders and if appropriate approvals are obtained.

It is anticipated that some of the internal roads will be retained for use by landholders following the cessation of mining, although this will be subject to consultation with relevant landholders during closure planning.

5.4.6 Plant Species Selection

Endemic plant species will be used for revegetation and will predominantly comprise those listed in Table 3. Annual cover crops will be utilised to provide short-term stabilisation to revegetation areas.

Table 3
Indicative Species Proposed for Native Revegetation

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Growth Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia fulva</td>
<td>Velvet Wattle</td>
<td>Erect Shrub/Tree</td>
</tr>
<tr>
<td>Allocasuarina torulosa</td>
<td>Forest Oak</td>
<td>Tree</td>
</tr>
<tr>
<td>Dodonaea megazyga</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. rhombifolia</td>
<td>Broad-leaf Hop-bush</td>
<td>Erect Shrub</td>
</tr>
<tr>
<td>Eucalyptus canaliculata</td>
<td>Grey Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>E. glaucina</td>
<td>Slaty Red Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>E. largeana</td>
<td>Craven Grey Box</td>
<td>Tree</td>
</tr>
<tr>
<td>E. punctata</td>
<td>Grey Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>E. rudderi</td>
<td>Rudder’s Box</td>
<td>Tree</td>
</tr>
<tr>
<td>E. tereticornis</td>
<td>Forest Red Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>Corymbia maculata</td>
<td>Spotted Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>E. crebra</td>
<td>Narrow-leaved Ironbark</td>
<td>Tree</td>
</tr>
<tr>
<td>E. tereticornis</td>
<td>Forest Red Gum</td>
<td>Tree</td>
</tr>
<tr>
<td>E. paniculata</td>
<td>Grey Ironbark</td>
<td>Tree</td>
</tr>
<tr>
<td>E. eugenioides</td>
<td>Thin-leaved Stringybark</td>
<td>Tree</td>
</tr>
<tr>
<td>E. moluccana</td>
<td>Grey Box</td>
<td>Tree</td>
</tr>
<tr>
<td>Acacia irrorata</td>
<td>Green Wattle</td>
<td>Erect Shrub/Tree</td>
</tr>
<tr>
<td>Acacia ulicifolia</td>
<td>Prickly Moses</td>
<td>Erect Shrub</td>
</tr>
<tr>
<td>Themeda australis</td>
<td>Kangaroo Grass</td>
<td>Grass</td>
</tr>
</tbody>
</table>


Selection of tree and pasture species will include consideration of the abutting vegetation type, site features (i.e. slope, anticipated ground conditions, availability of water), sowing season and prevailing weather conditions, seed availability, advice from seed suppliers and success or otherwise of earlier sowings. The use of Rhodes grass on rehabilitated areas will be avoided in the future.
5.5 GENERAL REHABILITATION PRACTICES AND MEASURES

5.5.1 Vegetation Clearance Plan

A vegetation clearance plan (also called a vegetation clearance protocol) (VCP) has been developed to minimise the impact of the vegetation clearance activities on flora and fauna at the DCM. The key components of the protocol are:

- delineation of areas to be cleared of native remnant vegetation;
- pre-clearance surveys;
- fauna management measures; and
- vegetation clearance supervision.

The Biodiversity Management Plan (Greening Australia, 2015) provides a detailed description of the VCP.

5.5.2 Collecting and Propagating Seed

During the VCP process (Section 5.5.1), and where feasible, trees may also be checked for their provision of seed to be utilised in the rehabilitation programme, followed by the collection of seed during felling activities. A key aim of seed collection is to collect local provenance seed stock for propagation purposes. Seed present during clearance activities will be collected for use in plant propagation programmes to provide tube stock for revegetation activities.

The Biodiversity Management Plan (Greening Australia, 2015) provides additional detail on the seed collection and propagation.

5.5.3 Salvaging and Reusing Material for Habitat Enhancement

Habitat features (e.g. trunks, logs, large rocks, branches, small stumps and roots) will be salvaged during vegetation clearance activities and stockpiled for relocation to areas undergoing rehabilitation. These features will potentially provide habitat resources for a range of invertebrate and ground dwelling fauna.

Feral pest animal utilisation of the DCM site (including the stockpiled habitat features) will be minimised by the implementation of measures as described in Section 5.5.7. Habitat features would also be stockpiled in disturbed areas where possible to minimise the potential for feral pest species to take refuge.

Relocation of trunks, logs, branches, small stumps and roots to post-mine rehabilitation areas can benefit the revegetation by increasing the mulch cover for the soil. The ground-layer vegetation and low shrubs will be incorporated into the topsoil when it is stripped. This will possibly enhance the soil seed bank on the rehabilitation. Weed control measures will be implemented for the DCM (including those areas proposed for topsoil stripping) as described in Section 5.5.6.
5.5.4 Soil Stripping Areas and Handling Measures

Disturbance areas will be stripped progressively (i.e. only as required) so as to reduce erosion and sediment generation, to reduce the extent of soil stockpiles and to utilise stripped soil as soon as possible for rehabilitation.

In accordance with Leading Practice Sustainable Development Program for the Mining Industry - Mine Rehabilitation (Department of Industry, Tourism and Resources, 2006), stripped soil will be directly placed on mine rehabilitation areas where areas are available for topsoil application. Where stockpiling is necessary, soil stockpiles are managed to maximise long-term viability through implementation of the following practices:

- the surface of the completed stockpiles are left in a “rough” condition to help promote water infiltration and minimise erosion prior to vegetation establishment;
- soil stockpiles have a maximum height of 3 m in order to limit the potential for anaerobic conditions to develop within the soil stockpile;
- soil stockpiles have an embankment grade of approximately 1V:4H (to limit the potential for erosion of the outer pile face);
- soil stockpiles are seeded and fertilised; and
- soil rejuvenation practices (e.g. fertiliser addition) are undertaken (if required) prior to re-spreading as part of rehabilitation works.

Detail with respect to the quantification of soil resources, stripping and reapplication schedules and stockpiling inventories will be included as part of the MOP and will be reported in the Annual Review.

5.5.5 Erosion and Sediment Control Works

Erosion control will be achieved by the development and implementation of land stabilisation procedures and protocols. Examples of the protocols and procedures that may be implemented during rehabilitation include:

- the use of stabilising techniques such as meshing, hydromulching and the application of approved rapid germinating pasture grasses in drainage channels; and
- the use of constructed rip-rap and gabion baskets at critical sites such as drainage confluences and outfalls to natural or existing drainage lines.

In accordance with the recommendations of the independent environmental audit (Trevor Brown & Associates, 2011), the establishment of groundcover on rehabilitated landforms will be completed in accordance with the timeframes included in Managing urban storm water – Soils and Construction Volume 1 (Landcom, 2004).

5.5.6 Weed Control

The presence of weeds will be identified via regular site inspections and communication with leasees and regulatory authorities. The following weeds are to be controlled annually within ML1427 and ML1646:

- lantana;
- Giant Parramatta Grass;
- small-leaved privet;
- blackberry;
- exotic *Sporobolus* sp. (e.g. rats tail grass) when encountered on access tracks;
- fireweed;
- Noogoora Burr;
- bittou bush;
- crofton weed; and
- other declared or key environmental weeds that have not yet been identified on-site.

In regard to weed management measures, physical removal and chemical application are the main weed control methods available. However, the implementation of measures that favour the restoration of healthy native vegetation is also considered an effective method of weed management.

The Biodiversity Management Plan (Greening Australia, 2015) provides additional detail on weed management.

### 5.5.7 Feral Pest Control

Feral pest animal utilisation of the DCM site will be minimised by:

- Removing available feed and maintaining a clean, rubbish-free environment in order to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna (e.g. introduced rodents, predators and birds).
- If a feral animal control program is implemented, such a control program is to be implemented and monitored according to relevant legislation.
- Monitoring of feral animals (including pigs, foxes, dogs, rabbits and other previously unnoted pest species) is to be undertaken every subsequent two years by a suitably qualified practitioner. If the results of these surveys indicate that a control program is necessary, such a control program is to be implemented and monitored according to relevant legislation.

### 5.5.8 Bushfire Management

Condition 54, Schedule 3 of the NSW Project Approval states that DCPL shall ensure that the DCM is suitably equipped to respond to any fires on site and assist the Rural Fire Service and emergency service as much as possible if there is a fire in the surrounding area.

Bushfire management measures in place at the DCM include:

- Controlled grazing – cattle are grazed on portions of ML 1427 where active mining operations are not occurring and appropriate fencing is available. Sustainable stocking levels result in low residual fuel loads.
- Hazard reduction burns, chemical control or slashing in accordance with appropriate licenses and approvals – in areas where controlled grazing is not possible or appropriate and fuel loads are high, hazard reduction burns may be undertaken.
- Firefighting equipment – if a significant bushfire was to occur on the DCM site the local Rural Fire Service will be called for assistance. The Rural Fire Service, if required, could be assisted by mine personnel and mine resources. The mine has a water cart with a water cannon and fire suppressant foam, trailer mounted fire-fighting equipment and dozers.
5.5.9 Controlling Vehicle Access

Vehicle access to the mine site will be limited to authorised personnel only. As described above, speed limits of 60 km per hour will be imposition of on vehicles using the mine roads and tracks.

5.5.10 Landscaping

Landscaping with planted trees will be undertaken for visual impact mitigation purposes. Landscaping will include:

- maintenance of the vegetation screen between the North Coast Railway line and the DCM, with additional maintenance plantings as required; and

- maintenance of the vegetation screen (established with advanced locally occurring native tree species) to screen views from the portion of The Bucketts Way where the DCM will be visible to traffic travelling along the road.

5.5.11 Site Contamination

Prior to mine closure and final rehabilitation a land contamination assessment will be conducted. Issues expected to be addressed by this assessment will include, but not be limited to, decontamination of areas such as those impacted by carbonaceous material (e.g. coal spillage, coal storage), by hydrocarbon spillage (e.g. workshops, fuel storage areas) or by sedimentation (e.g. dams which have directly received pit water).

It is expected that the details of the land contamination assessment will form part of the Mine Closure Plan (MCP) and will developed in conjunction with the MCP at a practicable time.

5.6 INTEGRATION WITH THE OFFSET STRATEGY

The DCM offset area is located on freehold DCPL-owned land to the south and east of the DCM area (Figure 3). The offset area directly adjoins land which has a conservation agreement included in its conditions of tenure. The integration of the offset area with DCM rehabilitation areas is shown on Figure 3. The integration of the offset area with the DCM rehabilitation areas will be undertaken in appropriately sized lots with suitable species to re-establish and complement local biodiversity.

In accordance with Condition 42, Schedule 3 of the NSW Project Approval, prior to 5 December 2015, unless otherwise agreed by the Secretary of the DP&E, DCPL will either:

(a) enter into a conservation agreement pursuant to s 69B of the *National Parks and Wildlife Act 1974* relating to the Offset areas, recording the obligations assumed by the Proponent under the conditions of this approval in relation to the Offset areas, and register that agreement pursuant to s 69F of the *National Parks and Wildlife Act 1974*; or

(b) cause to be registered against the titles of the Offset areas a public positive covenant and/or restriction on the use of land, in favour of the Director-General, requiring the proponent to implement and observe the conditions of this approval in relation to the Offset areas.

The conservation agreement or the public positive covenant and/or restriction on the use of the land, in relation to the Offset areas, shall remain in force in perpetuity.

Details of the management of the Offset area are provided in the Biodiversity Management Plan (Greening Australia, 2015).
6  REHABILITATION COMPLETION CRITERIA

The completion criteria outlined in Table 4 are designed to address rehabilitation objectives stated in Section 5.3 and have been developed with regard to Development of Rehabilitation Completion Criteria for Native Ecosystem Establishment on the Coal Mines in the Hunter Valley, Australian Coal Association Research Program Project C13048 (Australian Centre for Minerals Extension and Research, 2005).

Table 4
Key Completion Criteria

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Key Completion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Landforms</td>
<td>• Safe, stable, adequately drained post mining landforms consistent with the surrounding landscape as evidenced by comparative photography, water quality monitoring and geotechnical surveys.</td>
</tr>
<tr>
<td></td>
<td>• Geomorphic stability of drainage features comparable to existing natural drainage features as evidenced by cross-section and long-section surveys and monitoring of erosion.</td>
</tr>
<tr>
<td>Final Voids</td>
<td>• Surface water inflows to the final voids minimised through appropriate land forming as evidenced by revision of the water balance based on final as-built mine landforms.</td>
</tr>
<tr>
<td></td>
<td>• Final voids profiled for long-term stability as evidenced by geotechnical surveys of highwalls and endwalls.</td>
</tr>
<tr>
<td></td>
<td>• Perimeter bunding formed and security fencing installed.</td>
</tr>
<tr>
<td>Rehabilitation and Revegetation</td>
<td>• Woodland/riparian areas on trajectory towards self sustaining ecosystem¹ and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to reference sites.</td>
</tr>
<tr>
<td>Areas</td>
<td></td>
</tr>
<tr>
<td>Grazing Areas</td>
<td>• Stocking rates of between 1.5 and 4.0 dry sheep equivalents (DSE) per hectare (average 2.8 DSE) in accordance with Beef Stocking Rates and Farm Size – Hunter region (DPI, 2006) for native unimproved pasture – moderate fertility as evidenced by monitoring of grazing and groundcover.</td>
</tr>
</tbody>
</table>

Note: ¹ As measured by Landscape Function Analysis (LFA) or similar systems-based approach.

A summary of the rehabilitation objectives, performance indicators and completion criteria relevant to each rehabilitation domain is provided in Table 5.

Rehabilitation will need to achieve a standard which satisfies the DRE.
Table 5
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rehabilitation Phase – Decommissioning</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 1B – Infrastructure Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Duralie Extension Project Environmental Assessment. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify any contaminated soils associated within the infrastructure areas and rail siding and remediate in accordance with the requirements of the NSW Contaminated Land Management Act, 1997.</td>
<td>Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW Contaminated Land Management Act, 1997.</td>
<td>Contaminated soils removed and remediation completed in accordance with requirements of the NSW Contaminated Land Management Act, 1997 (which references soil quality criteria [e.g. pH]).</td>
<td>Duralie Extension Project Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 2A/2B – Water Management Area (Backfilled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water management infrastructure (i.e. pump and pipeline systems) will be dismantled and removed from site and either sold or transferred to another Yancoal site.</td>
<td>Undertake consultation to confirm any alternative use for water management infrastructure post-mining.</td>
<td>Consultation complete. Decision made regarding post-mining use of retained infrastructure.</td>
<td>Duralie Extension Project Environmental Assessment.</td>
</tr>
<tr>
<td></td>
<td>Relevant water management infrastructure dismantled and removed (as agreed via consultation).</td>
<td>Complete removal of relevant infrastructure (as agreed via consultation).</td>
<td>Duralie Extension Project Environmental Assessment.</td>
</tr>
<tr>
<td></td>
<td>Sediment control dams will be dewatered to either in one of the final voids or transferred offsite for disposal at relevant facility.</td>
<td>Sediment control dams dewatered.</td>
<td>Dewatering of sediment control dams complete.</td>
</tr>
<tr>
<td></td>
<td>Any contaminated sediments in water management structures will be identified and remediated in accordance with the requirements of the NSW Contaminated Land Management Act, 1997.</td>
<td>Contaminated sediments identified and proposed remediation measures consistent with requirements of the NSW Contaminated Land Management Act, 1997.</td>
<td>Contaminated sediments removed and remediation completed in accordance with requirements of the NSW Contaminated Land Management Act, 1997 (which references soil quality criteria [e.g. pH]).</td>
</tr>
<tr>
<td>Objective</td>
<td>Performance Indicator</td>
<td>Completion Criteria</td>
<td>Justification/Source</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Rehabilitation Phase – Decommissioning (Cont)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 2C – Permanent Water Management Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent water management areas/structures (i.e. permanent diversions, drains and water storages) are stable and safe.</td>
<td>The stability of permanent water management structures has been assessed.</td>
<td>Structures have been assessed as stable and safe determined by periodic monitoring.</td>
<td>Duralie Extension Project Environmental Assessment. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 4D – Open Cut Pit (Final Void/Water Storage)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cease dewatering open cut pits and remove all associated infrastructure.</td>
<td>Infrastructure dismantled and removed.</td>
<td>Infrastructure removed.</td>
<td>Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 5E – Offset Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Areas will be fenced to restrict access and exclude grazing during revegetation establishment/existing vegetation enhancement phase.</td>
<td>Construct fencing around perimeter of offset areas.</td>
<td>Construction of perimeter fencing complete.</td>
<td>Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td>The Offset Areas will be protected in perpetuity.</td>
<td>Undertake consultation with relevant regulatory agencies and landholders to confirm arrangement for protection of the offset areas.</td>
<td>Consultation complete. Decision made regarding arrangement for protection of the offset areas.</td>
<td>Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Rehabilitation Phase – Landform Establishment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 1B – Infrastructure Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profile the domain to a free-draining landform.</td>
<td>Free-draining landform.</td>
<td>Safe, stable, adequately drained post-mining landforms consistent with the surrounding landscape as evidenced by comparative photography, water quality monitoring and geotechnical surveys.</td>
<td>Table 4.</td>
</tr>
<tr>
<td><strong>Domain 2A/2B – Water Management Area (Backfilled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-shape embankments and re-profile the domain to a free-draining landform.</td>
<td>Free-draining landform.</td>
<td>Safe, stable, adequately drained post-mining landforms consistent with the surrounding landscape as evidenced by comparative photography, water quality monitoring and geotechnical surveys.</td>
<td>Table 4.</td>
</tr>
</tbody>
</table>
### Table 5 (Continued)
**Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 2C – Permanent Water Management Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create stable structures.</td>
<td>Dams Safety Committee Consulted.</td>
<td>Structures constructed in accordance with approved design. Low longitudinal gradients (i.e. 0.5%). Design to convey 1:100 Average Recurrence Interval intensity rainfall event.</td>
<td>Duralie Extension Project Environmental Assessment.</td>
</tr>
<tr>
<td>Drainage channel which generally replicates the original meandering geometry of Coal Shaft Creek.</td>
<td>Channel profile. Channel alignment. Bed slope.</td>
<td>Safe, stable drainage channel generally consistent with the surrounding landscape as evidenced by geomorphic and geotechnical surveys.</td>
<td>Surface Water Management Plan.</td>
</tr>
<tr>
<td>Development of a low permeability liner of the final Coal Shaft Creek alignment.</td>
<td>Bed permeability. Hydraulic assessment.</td>
<td>Hydraulic assessment indicates the engineered low permeability liner has an acceptable level of permeability to restrict water movement between Coal Shaft Creek and the waste emplacement.</td>
<td>Surface Water Management Plan.</td>
</tr>
<tr>
<td>Construction of drop down structure(s) as part of the final Coal Shaft Creek alignment.</td>
<td>Free-draining landform.</td>
<td>Safe, stable structure as evidenced by qualified engineering design and geotechnical assessment.</td>
<td>Surface Water Management Plan.</td>
</tr>
<tr>
<td><strong>Domain 3A/3B – Waste Emplacement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimise long-term erosion on waste emplacements.</td>
<td>Slope of landform. Berm design. Removal of large rocks.</td>
<td>Waste emplacements constructed in accordance with approved design. The gradient for waste emplacement slopes will be designed at approximately 1 V:4 H. Drainage on the outer emplacement batters is facilitated via contour drains with a longitudinal grade of 1% flattening to 0.6%. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.</td>
<td>Section 5.4.2. Surface Water Management Plan.</td>
</tr>
<tr>
<td>Elevation of waste emplacements constructed in accordance with approved design.</td>
<td>Elevation of landform.</td>
<td>Waste emplacements constructed in accordance with approved design.</td>
<td>Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
</tbody>
</table>
### Table 5 (Continued)
**Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 4D – Open Cut Pit (Final Void/Water Storage)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimise catchment of final voids.</td>
<td>Up-catchment diversion. Contour drains.</td>
<td>Up-catchment diversions and contour drains constructed around final voids in accordance with approved design.</td>
<td>Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td>Restrict access.</td>
<td>Bunding, fencing and/or signage will be installed around perimeter of final voids.</td>
<td>Bunding, fencing and/or signage installed and access restricted.</td>
<td>Section 5.3.5.</td>
</tr>
<tr>
<td><strong>Domain 5E – Offset Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rehabilitation Phase – Growth Medium Development</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 1B – Infrastructure Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth medium developed to sustain proposed post-mining vegetation communities (e.g. woodland/open forest).</td>
<td>Topsoil depth.</td>
<td>Approximately 100 millimetres (mm) to 150 mm topsoil.</td>
<td>Successful rehabilitation experience.</td>
</tr>
<tr>
<td><strong>Domain 2A/2B – Water Management Area (Backfilled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).</td>
<td>Topsoil depth.</td>
<td>Approximately 100 mm to 150 mm topsoil.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
<tr>
<td><strong>Domain 2C – Permanent Water Management Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth medium established on relevant areas of permanent water management structures (i.e. on embankments of retained dams and permanent Coal Shaft Creek alignment).</td>
<td>Topsoil depth.</td>
<td>Approximately 100 mm to 150 mm topsoil.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
<tr>
<td>Objective</td>
<td>Performance Indicator</td>
<td>Completion Criteria</td>
<td>Justification/Source</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Domain 3A/3B – Waste Emplacement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).</td>
<td>Topsoil depth.</td>
<td>Approximately 100 mm to 150 mm topsoil.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
<tr>
<td>Growth medium is structurally stable to minimise long-term erosion potential.</td>
<td>Soil fertility test conducted to determine requirement for soil treatments (e.g. lime, gypsum, fertilizer).</td>
<td>Growth medium stable and prepared for planting.</td>
<td>Section 5.5.4.</td>
</tr>
<tr>
<td>Slopes contour ripped to minimise erosion potential. Other measures described in the RMP implemented as necessary to control erosion.</td>
<td>Monitoring of erosion incidence.</td>
<td>Slopes contour ripped and low incidence of erosion on waste emplacement slopes.</td>
<td>Section 5.4.2.</td>
</tr>
<tr>
<td><strong>Domain 4D – Open Cut Pit (Final Void/Water Storage)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perimeter bunds will be revegetated with endemic woodland species upon completion of construction.</td>
<td>Topsoil depth.</td>
<td>Approximately 100 mm to 150 mm topsoil placed on perimeter bunds to support revegetation.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
<tr>
<td><strong>Domain 5E – Offset Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance existing vegetation and establish new vegetation.</td>
<td>Soil fertility test conducted to determine requirement for soil treatments (e.g. lime, gypsum, fertilizer).</td>
<td>Growth medium stable and prepared for planting.</td>
<td>Section 5.5.4 and Biodiversity Management Plan.</td>
</tr>
<tr>
<td><strong>Rehabilitation Phase – Ecosystem and Land Use Establishment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 1B – Infrastructure Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The domain will be revegetated to woodland/open forest trees via seed and/or tube stock (if required).</td>
<td>LFA indices.</td>
<td>Suitable LFA reference site selected. LFA results indicate that vegetation is developing similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert.</td>
<td>Section 7. LFA. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
</tbody>
</table>
Table 5 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 2A – Water Management Area (Backfilled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The domain will be revegetated to pasture, with scattered endemic woodland/open forest trees via seed and/or tubestock (if required).</td>
<td>LFA indices.</td>
<td>LFA results indicate that the pasture is developing similar to that found in the relevant reference site.</td>
<td>Section 7. LFA. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 2B – Water Management Area (Backfilled)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The domain will be revegetated to woodland/open forest trees via seed and/or tubestock (if required).</td>
<td>LFA indices.</td>
<td>Suitable LFA reference site selected. LFA results indicate that vegetation is developing similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert.</td>
<td>Section 7. LFA. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 2C – Permanent Water Management Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent water management structures are operating effectively.</td>
<td>Internal geotechnical assessment.</td>
<td>During mine closure phase, internal geotechnical assessment confirms that permanent water management structures are stable and effective.</td>
<td>Section 5.4.3.</td>
</tr>
<tr>
<td>Some sediment control dams may be retained as farm dams where agreed in consultation with relevant regulatory agencies and landholders.</td>
<td>Undertake consultation with relevant local landholders and regulatory agencies regarding long-term use of sediment control dams.</td>
<td>Arrangements confirmed for long-term use of retained sediment control dams and any other dam retained for future agricultural use.</td>
<td>Section 5.4.4. Surface Water Management Plan.</td>
</tr>
<tr>
<td>Vegetate banks of final Coal Shaft Creek alignment with riverine vegetation.</td>
<td>LFA indices.</td>
<td>Suitable LFA reference site selected. LFA results indicate that vegetation is developing similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert.</td>
<td>Surface Water Management Plan.</td>
</tr>
<tr>
<td><strong>Domain 3A – Waste Emplacement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste emplacement areas will be revegetated with pasture, with scattered endemic woodland/open forest trees via seed and/or tubestock (if required).</td>
<td>LFA indices.</td>
<td>Suitable LFA reference site selected. LFA results indicate that the pasture is developing similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
</tbody>
</table>
Table 5 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 3B – Waste Emplacement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste emplacement areas will be revegetated with woodland/open forest trees via seed and/or tubestock (if required).</td>
<td>LFA indices.</td>
<td>Suitable LFA reference site selected. LFA results indicate that vegetation is developing similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert.</td>
<td>Successful rehabilitation experience. Monitoring of Landscape Function and Vegetation Structure of rehabilitation areas at the DCM.</td>
</tr>
<tr>
<td><strong>Domain 4D – Open Cut Pit (Final Void/Water Storage)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe, stable and non-polluting.</td>
<td>Internal geotechnical and water quality assessment.</td>
<td>During mine closure phase, internal geotechnical and water quality assessments confirm that final voids are safe, stable and non-polluting.</td>
<td>Section 5.4.1. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 5E – Offset Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhance existing vegetation and establish new vegetation in accordance with the BMP.</td>
<td>Monitoring of vegetation establishment and enhancement in accordance with the BMP.</td>
<td>Monitoring indicates vegetation is maturing and developing characteristics similar to that found in the relevant reference site.</td>
<td>Biodiversity Management Plan. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Rehabilitation Phase – Ecosystem and Land Use Sustainability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Domain 1B – Infrastructure Area (Woodland/Open Forest)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.</td>
<td>LFA indices.</td>
<td>LFA results indicate woodland/open forest areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to unmined control sites of remnant vegetation.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td>Runoff from rehabilitated areas is suitable for discharge off-site</td>
<td>Water quality monitoring results.</td>
<td>Median water quality for 24 months of data is within 10% of the median values of control catchments and 25% of the 80th percentile for electrical conductivity (EC), pH and total suspended solids (TSS) and 25% of the 20th percentile for pH.</td>
<td>Surface Water Management Plan.</td>
</tr>
</tbody>
</table>

---

5 Control catchments under consideration include Coal Shaft Creek (pre-mine and post-mine up-catchment of the DCM), Avondale Creek (pre-mine and post-mine up-catchment of Stratford Mining Complex) and/or other adjacent catchments subject to availability of data (e.g. tributaries east of Mammy Johnsons River, Chainy Flat Creek and Coal Creek).
### Table 5 (Continued)
**Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Domain 2A – Water Management Area (Backfilled) (Pasture/Scattered Trees)</strong></td>
<td>Areas of pasture, with scattered endemic woodland/open forest trees, are suitable for grazing.</td>
<td>LFA results indicate the pasture areas are on a trajectory towards self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert. Stocking rates between 1.5 and 4.0 DSE per ha within 5 years of first planting.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 2B – Water Management Area (Backfilled) (Woodland/Open Forest)</strong></td>
<td>Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.</td>
<td>LFA results indicate woodland/open forest areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to unmined control sites of remnant vegetation.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td><strong>Domain 2C – Permanent Water Management Area</strong></td>
<td>Runoff from rehabilitated areas is suitable for discharge off-site</td>
<td>Water quality monitoring results.</td>
<td>Median water quality for 24 months of data is within 10% of the median values of control catchments and 25% of the 80th percentile for EC, pH and TSS and 25% of the 20th percentile for pH.</td>
</tr>
<tr>
<td><strong>Domain 3A – Waste Emplacement (Pasture/Scattered Trees)</strong></td>
<td>Areas of pasture, with scattered endemic woodland/open forest trees, are suitable for grazing.</td>
<td>LFA results indicate the pasture areas are on a trajectory towards self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycle by a suitably qualified expert. Stocking rates between 1.5 and 4.0 DSE per ha.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td>Domain 3B – Waste Emplacement (Woodland/Open Forest)</td>
<td>Performance Indicator</td>
<td>Completion Criteria</td>
<td>Justification/Source</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.</td>
<td>LFA indices.</td>
<td>LFA results indicate woodland/open forest areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to unmined control sites of remnant vegetation.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domain 3A/B – Waste Emplacement</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runoff from rehabilitated areas is suitable for discharge off-site</td>
<td>Water quality monitoring results.</td>
<td>Median water quality for 24 months of data is within 10% of the median values of control catchments and 25% of the 80th percentile for EC, pH and TSS and 25% of the 20th percentile for pH.</td>
<td>Surface Water Management Plan.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domain 4D – Open Cut Pit (Final Void/Water Storage)</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe, stable and non-polluting.</td>
<td>Regulatory (e.g. DTIRIS-DRE) assessment at mine closure</td>
<td>At mine closure, relevant regulatory agencies (e.g. DTIRIS-DRE) confirm that final voids are safe, stable and non-polluting.</td>
<td>Section 6. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domain 5E – Offset Area</th>
<th>Performance Indicator</th>
<th>Completion Criteria</th>
<th>Justification/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance existing vegetation and establish new vegetation.</td>
<td>Long-term land tenure security mechanism in place. LFA indices.</td>
<td>Areas of existing remnant vegetation within the Offset areas (299 ha) have been conserved and enhanced.</td>
<td>Section 7. Duralie Open Pit Modification Environmental Assessment.</td>
</tr>
<tr>
<td>357.5 ha of revegetated land on a trajectory to a self-sustaining ecosystem.</td>
<td>Flora assessment of offset areas and DCM rehabilitation areas.</td>
<td>Native vegetation has been established which directly links vegetation areas of the Offset areas with the Rehabilitation area.</td>
<td>Biodiversity Management Plan.</td>
</tr>
</tbody>
</table>
7 REHABILITATION AND REVEGETATION MONITORING

Ongoing monitoring and maintenance of rehabilitation areas at the DCM will be conducted to assess:

- progression of rehabilitated land; and
- effectiveness of rehabilitation techniques used (including soil erosion controls, water quality and revegetation methods).

Monitoring of rehabilitation activities at the DCM will include the following:

- evaluating spread topsoil profile thickness and quality prior to sowing;
- observing drains and assessment of water quality to determine whether substantial silting of invert and/or any localised failure of the drain embankment has occurred;
- observing recently topsoiled areas after rain events (particularly on sloping ground) to determine if any significant rilling or loss of topsoil has occurred;
- assessing germination success (diversity and abundance);
- evaluating the behaviour of placed topsoil;
- assessing the degree of vegetative ground coverage achieved over time;
- assessing the survival rate for sown species by type and location;
- recording information on observations (by photographic record, file notation, etc.); and
- evaluating threats posed to rehabilitated areas posed by weed infestation, feral animals, cattle, etc.

The performance of rehabilitation and revegetation areas will be monitored using LFA or a similar systems-based approach. LFA is a Commonwealth Scientific and Industrial Research Organisation developed method used to provide indicators of rehabilitation success and allows the assessment of landscape processes. LFA aims to measure the progression of rehabilitation towards a self-sustaining ecosystem through the assessment of landscape function. Key completion criteria for the DCM are outlined in Section 6.

Prior to the first monitoring period, the site will be separated into geographical areas to facilitate a structured approach to rehabilitation monitoring. LFA Revegetation Transects will be established at the DCM in each of the rehabilitation areas. The location of each transect will be determined on the basis of representative slope, aspect and the target vegetation community. LFA Analogue Transects will be established in proximal areas to represent the varying landscapes (i.e. slopes and aspects) and target communities planned for each rehabilitation area. The location of LFA Revegetation Transects and Ecosystem Function Analysis Analogue Transects will be established in consultation with a suitably qualified specialist and relevant government regulators.

The representativeness of the LFA transects will be reviewed during each monitoring round to confirm that transects continue to accurately represent the status of rehabilitation across each of the rehabilitation areas.

DCPL will commence the rehabilitation monitoring programme described above in spring 2012. Rehabilitation monitoring will be conducted annually each spring.
Monitoring results along with monitoring site locations, parameters and frequencies will be reviewed annually through the Annual Review process. Where deficiencies are observed within rehabilitated areas which require remedial works, such works will be undertaken at the earliest possible opportunity, subject to resource availability, season, ground condition and access considerations.
8 CONTINGENCY MEASURES

Rehabilitated areas will be monitored as described in Section 7 and visually on regular basis to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (i.e. supplementary plantings, weed control and erosion control).

In the event that monitoring indicates the rehabilitated areas are not progressing towards achieving the key completion criteria (Table 5), the following contingency measures may be considered:

- implementation of additional erosion and sediment control works;
- implementation of additional weed and/or pest control measures;
- amendment to access, fencing and grazing arrangements;
- replacement planting of areas where revegetation has failed;
- consideration of applying soil ameliorants (e.g. fertilisers); and
- amendment to planting specifications where it can be demonstrated that suggested alterations will not impact on achieving completion criteria or approval conditions.
9 MINE CLOSURE PLANNING

The most effective MCP can only be produced at a time prior to mine closure when the final context of the site is clear and confirmed. Appropriate timing of the MCP will therefore also ensure the most successful and complete rehabilitation outcomes for the DCM. Once the final context of the DCM site is confirmed preparation of the MCP can begin.

Additionally, as rehabilitation will be progressively undertaken during the mine life, the majority of rehabilitated areas are expected to be fully established at the time of mine closure. Therefore the MCP will address the following issues during the mine closure process:

- adequate consideration of all stakeholders;
- maximising the progress of mine closure while remaining cost effective and timely;
- providing accountability and efficient and adequate resourcing;
- demolition and removal of remaining infrastructure (e.g. buildings, conveyors, gantries, concrete footings, tanks, rail lines). Removal of infrastructure throughout the life of the mine, where appropriate, will also be progressive;
- retaining infrastructure which is considered of value post closure, subject to the necessary approvals;
- decontamination of areas such as those impacted by carbonaceous material (e.g. coal spillage, coal storage), by hydrocarbon spillage (e.g. workshops, fuel storage areas) or by sedimentation (e.g. dams which have directly received pit water);
- completion of the reshaping, topsoiling and vegetation establishment of disturbed ground;
- ensuring land stability, drainage and revegetation meet regulator requirements/criteria for bond release;
- rehabilitation of former mine areas to where they can support nominated final land uses;
- rendering of mine landforms safe through relevant security engineering (e.g. berms, fencing, water inundation);
- demobilisation of all earthmoving plant (e.g. dump trucks, excavators);
- addressing standards and issues related to whole of life considerations;
- investigating the use of a consultative closure committee as a part of stakeholder engagement;
- developing a human resources plan to manage the staged release of employees and to support redeployment where appropriate;
- implementing of the Mine Lease relinquishment process; and
- post closure requirements such as noxious weed control, exclusion or control of grazing animals from designated areas, control of public access, fire management and maintenance of safety signage/fencing.

The above list does not represent the full scope of issues anticipated to be considered for the MCP. Detailed discussions with stakeholders as the MCP is prepared (e.g. regulatory agencies and community representatives) are likely to identify additional issues which may be incorporated into the final MCP.
10 REHABILITATION REPORTING AND REVIEW

In accordance with Condition 2(g), Schedule 5 of the NSW Project Approval, DCPL has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

A review of DCPL’s compliance with all conditions of the NSW Project Approval, mining leases and all other approvals and licenses will be undertaken prior to (and included within) each Annual Review. The Annual Review will be made publicly available on the Duralie Coal website.

In accordance with Condition 8, Schedule 5 of the NSW Project Approval, an independent environmental audit will be undertaken by the end of December 2011\(^7\), and every three years thereafter. A copy of the audit report will be submitted to the Secretary of DP&E and made publicly available on the Duralie Coal website. The independent audit will be undertaken by an appropriately qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary of the DP&E.

In accordance with Condition 4, Schedule 5 of the NSW Project Approval, this RMP will be reviewed, and if necessary revised to the satisfaction of the Secretary of the DP&E within three months of the submission of:

- an Annual Review\(^8\), in accordance with Condition 3, Schedule 5;
- an incident report, in accordance with Condition 6, Schedule 5;
- an audit, in accordance with Condition 8, Schedule 5;
- any modification to the conditions of the NSW Project Approval; or
- prior to the commencement of clearing in accordance with the *Duralie Open Pit Modification Environmental Assessment* (DCPL, 2014).

The review will include an assessment of the current rehabilitation management measures and performance against key completion criteria. Any amendments will be made to reflect the identified areas for improvement to rehabilitation management measures and undertaken in consultation with the appropriate regulatory authorities.

This RMP will be made publicly available on the Duralie Coal website, in accordance with Condition 10, Schedule 5 of the NSW Project Approval. A hard copy will also be kept at the DCM.

The Manager – Environment and Community will be responsible for the monitoring and implementation of this RMP.

---

\(^7\) An independent environmental audit was completed in November 2014 (Trevor Brown & Associates, 2014).

\(^8\) The Duralie Coal Mine Annual Review (DCPL, 2014) was completed in September 2014. No changes to current RMP management and mitigation measures were proposed.
11 REFERENCES


Duralie Coal Pty Ltd (2011) Duralie Coal Mine Annual Review.


NSW Department of Primary Industries (2006) Beef Stocking Rates and Farm Size.


APPENDIX A

RELEVANT EXTRACTS FROM
MINING LEASE 1427 AND MINING LEASE 1646
EXTRACTION OF COAL

1. The lease holder shall extract as large a percentage of the coal in the subject area as is practicable consistent with the provisions of the Coal Mines Regulations Act 1982 and the Regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.

MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP)

MINING OPERATIONS PLAN (MOP)

2. (a) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) approved by the Director General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:

(i) ongoing mining operations and environmental management; and

(ii) ongoing monitoring of the project.

(b) The Plan must be prepared in accordance with the Director General’s guidelines current at the time of lodgement.

(c) An application for approval of a proposed Plan must be accompanied by a copy of the Plan and must be lodged with the Director General:

(i) prior to the commencement of operations; and

(ii) subsequently as appropriate.

(d) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:

(i) area(s) proposed to be disturbed under the Plan;

(ii) mining and rehabilitation method(s) to be used and their sequence;

(iii) existing and proposed surface infrastructure;

(iv) progressive rehabilitation schedules;

(v) areas of particular environmental sensitivity;
(vi) water management systems; and

(vii) proposed resource recovery.

(viii) handling and management of potential acid forming waste material, so as to control and prevent acid mine drainage.

(e) Where the lease holder and/or the Director General is of the opinion that a Plan should be amended, the lease holder shall submit an amended Plan for approval.

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT (AEMR)

3 (a) Within twelve (12) months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director General.

(b) The AEMR must be prepared in accordance with the Director General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve (12) months in terms of:

(i) the approved Mining Operations Plan;

(ii) development consent requirements and conditions; and

(iii) Environment Protection Authority licences and approvals;

(iv) any other statutory environmental requirements;

(v) details of any variations to environmental approvals applicable to the lease area.

(c) After considering an AEMR the Director General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in such manner and within such period as may be specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.

(d) The lease holder shall, as and when directed by the Minister, co-operate with the Director General to conduct and facilitate review of the AEMR involving other government agencies.
EXCAVATIONS

14 Operations shall be conducted in such a manner as not to cause any danger to persons or stock and the lease holder shall provide and maintain adequate protection to the satisfaction of the Minister around each shaft or excavation opened up or used by the lease holder.

DUMPS

15 The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any dumps of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding.

MANAGEMENT AND REHABILITATION OF LANDS (GENERAL)

18 The lease holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof or the Minister and subject to such conditions as the Minister may stipulate.

19 The lease holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.

20 If required to do so by the Minister and within such time as may be stipulated by the Minister the lease holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.

21 If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.

22 Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.

23 If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.

24 The lease holder shall take all precautions against causing outbreak of fire on the subject area.
The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination or pollution of groundwater and to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing the contamination or pollution of groundwater and the contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.

BLASTING

The lease holder shall monitor noise and vibration and institute controls, generally in accordance with the recommendations of Australian Standard AS-2187-1993 and ANZEC Guidelines.

(a) Ground Vibration

The lease holder shall design all blasts on the basis that the ground vibration peak particle velocity generated by any blasting within the subject area, shall not exceed the levels in or conditions of the EPA Licence for the mine, at any dwelling or occupied premises not owned by the lease holder, the holder of an authority under the Mining Act, or not subject to a valid agreement with the lease holder, with respect to the effects of blasting.

(b) Blast Overpressure

The lease holder shall design all blasts on the basis that the blast overpressure noise level generated by any blasting within the subject area, shall not exceed the levels in or conditions of the EPA Licence for the mine, at any dwelling or occupied premises not owned by the lease holder, the holder of an authority under the Mining Act, or not subject to a valid agreement with the lease holder, with respect to the effects of blasting.

TREES (PLANTING AND PROTECTION OF) FLORA AND FAUNA AND ARBOREAL SCREENS

If so directed by the Minister, the lease holder shall ensure that operations are carried out in such manner so as to minimise disturbance to flora and fauna within the subject area.

ROADS

The lease holder shall pay to Great Lakes Council and Gloucester Council, Department of Land and Water Conservation or the Chief Executive, Roads and Traffic Authority the cost incurred by such Council or Department or Chief Executive of making good any damage caused by operations carried on by or under the authority of the lease holder to any road adjoining or traversing the surface or the excepted surface or the excepted surface, as the case may be of the subject area.
lease holder may incur respect of any accident or injury to any person or property which may arise out of the construction maintenance or working of any workings now existing or to be made by the lease holder within the boundaries of the subject area or in connection with any of the operations notwithstanding that all other conditions of this authority shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease which the lease holder may be licensed or compelled to do hereunder.

49 The lease holder shall save harmless the Crown from payment of compensation and from and against all claims, actions, suits or demands whatsoever in the event of any damage resulting from mining operations under or near the subject area.

PROSPECTING (GENERAL)

50 (a) Where the lease holder desires to commence prospecting operations in the subject area the lease holder shall notify the Director General in writing and shall comply with such additional conditions as the Minister may impose including any condition requiring the lodgement of an additional bond or other form of security or rehabilitation of the area affected by such operations.

(b) Where the lease holder notifies the Director General pursuant to sub paragraph (a) of this condition the lease holder shall furnish with that notification details of the type of prospecting methods that would be adopted and the extent and location of the area that would be affected by them.

SECURITY DEPOSIT

51 (a) The lease holder shall, upon request by the Director General, lodge with the Minister the sum of two hundred and fifty thousand dollars ($250,000) in accordance with Instructions for Manner of Lodgement of Security Deposits as security for the fulfillment of the obligations of the lease holder under this authority. In the event that the lease holder fails to fulfill any of the lease holder’s obligations under this authority the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purposes of the clause a lease holder shall be deemed to have failed to fulfill the lease holder’s obligations under this authority, if the lease holder fails to comply with any condition or provision of this authority, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision of this authority or of any provision of the Act or regulations made thereunder.

(b) The Minister may at any time after the commencement of this authority or any renewal thereof, vary the amount of security required in accordance with this condition.

(c) Where the amount of security has been increased pursuant to Clause (b) hereof the lease holder shall, within two (2) months of being requested by the Minister, lodge a security for the amount of security required, in which case the Minister shall refund or release to the lease holder the security previously lodged.
ROYALTY AT ADDITIONAL RATE

54. The lease holder shall during the term of this authority pay to the Minister royalty at the additional rate as prescribed by the Regulations for coal recovered by open cut mining methods from the area of the lease.

SPECIAL CONDITIONS:

DAM SAFETY

55. The lease holder shall submit detailed designs of the main waste water dam to the Dam Safety Committee prior to commencement of construction of the dam.

STROUD TO TAREE TRANSMISSION LINE

56. The lease holder shall not commence mining until such time as a valid agreement has been entered into between the lease holder and Transgrid with respect to the protection of the Stroud to Taree 132 kV transmission line (96F).

WATER MANAGEMENT

57. The lease holder shall ensure that all works for the management of clean water and dirty water are constructed to the satisfaction of the Department of Land and Water Conservation.

58. During rehabilitation of mining operations, the lease holder shall construct fish passages from Mammy Johnson's River to water storage dams considered suitable for aquatic life. These fish passages must be constructed in accordance with the requirements of NSW Fisheries.

59. During rehabilitation of mining operations, the lease holder shall restore stream bank vegetation around affected water bodies and stock all storage dams considered suitable for aquatic life with juvenile Australian Bass or other fish species, as directed by NSW Fisheries.

60. Once the area has been rehabilitated, the lease holder shall make provision for public access for recreational purposes to appropriate areas.

BLASTING

61. The lease holder shall not carry out blasting during the first year of excavation activities required for the opening of the box cut on the eastern flank of the operational area, unless the lease holder has developed blasting methodologies to the satisfaction of the Department of Mineral Resources
and Department of Land and Water Conservation, so as to minimise the risk of induced fracturing.

62 The lease holder shall not carry out blasting within 600 metres of the North Coast Railway, until such time as a detailed procedure plan for blasting has been approved by the Rail Access Corporation and the Department of Mineral Resources.

63 The lease holder shall monitor all blasts and record overpressure and peak particle velocity at the locations specified by the Environmental Protection Authority and the Department of Mineral Resources.

REHABILITATION AND REMEDIAL WORKS

64 The lease holder shall carry out rehabilitation in accordance with the requirements of an approved Mining Operations Plan.

65 The lease holder shall ensure prompt and effective rehabilitation of all disturbed areas, in accordance with the requirements of the Department of Mineral Resources, so as to minimise the generation of wind erosion and dust.

66 If so directed by the Minister, the lease holder shall carry out any remedial work required to minimise or rectify any adverse impact on the environment, that can be proven to be the result of mining or mining related activities on this mining lease.

67 The lease holder shall comply with any direction which might be given by the Minister, with regard to the handling and management of potential acid forming waste material.

BUFFER TO RIVER

68 The lease holder shall maintain an undisturbed buffer with a minimum width of 30 metres, between development works, including the rail diversion and the western bank of Mammy Johnson’s River. This buffer shall be defined by a fence which must be erected prior to commencement of construction works.

69 The lease holder shall pay Rail Access Corporation the cost of making good any damage caused by operations carried on, by, or under the authority of the lease holder to any rail infrastructure of the subject area.
3. Mining Operations Plan

(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director-General.

(b) The MOP must:

(i) identify areas that will be disturbed by mining operations;
(ii) detail the staging of specific mining operations;
(iii) identify how the mine will be managed to allow mine closure;
(iv) identify how mining operations will be carried out in order to prevent and or minimise harm to the environment;
(v) reflect the conditions of approval under:
   - the Environmental Planning and Assessment Act 1979
   - and any other approvals relevant to the development including the conditions of this lease; and
   - have regard to any relevant guidelines adopted by the Director-General.

(c) The leaseholder may apply to the Director-General to amend an approved MOP at any time.

(d) It is not a breach of this condition if:

(i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the Mining Act 1992, the Environmental Planning and Assessment Act 1979, Protection of the Environment Operations Act 1997, Mine Health and Safety Act 2004 / Coal Mine Health and Safety Act 2002 and Mine Health and Safety Regulation 2007 / Coal Mine Health and Safety Regulation 2006 or the Occupational Health and Safety Act 2000; and

(ii) the Director-General had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.

(e) A MOP ceases to have effect 7 years after date of approval or other such period as identified by the Director-General.
4. Environment Management Report
   (a) The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.
   (b) The EMR must:
       (i) report against compliance with the MOP;
       (ii) report on progress in respect of rehabilitation completion criteria;
       (iii) report on the extent of compliance with regulatory requirements; and
       (iv) have regard to any relevant guidelines adopted by the Director-General;

5. Environmental Incident Report
   (a) The lease holder must report any environmental incidents. The report must:
       (i) be prepared according to any relevant Departmental guidelines;
       (ii) be submitted within 24 hours of the environmental incident occurring;
   (b) For the purposes of this condition, environmental incident includes:
       (i) any incident causing or threatening material harm to the environment
       (ii) any breach of Conditions 1 to 9 and 11 to 24;
       (iii) any breach of environment protection legislation; or,
       (iv) a serious complaint from landholders or the public.
   (c) For the purposes of this condition, harm to the environment is material if:
       (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
       (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, where loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

6. Additional Environmental Reports
   Additional environmental reports may be required from time to time as directed in writing by the Director-General and must be lodged as instructed.
7. Rehabilitation

Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the Director-General.

8. Subsidence Management

(a) The lease holder shall prepare a Subsidence Management Plan prior to commencing any underground mining operations which will potentially lead to subsidence of the land surface.

(b) Underground mining operations which will potentially lead to subsidence include secondary extraction panels such as longwalls or miniwalls, associated first workings (gateroads, installation roads and associated main headings, etc), and pillar extractions, and are otherwise defined by the Applications for Subsidence Management Approvals guidelines (EDG17).

(c) The lease holder must not commence or undertake underground mining operations that will potentially lead to subsidence other than in accordance with a Subsidence Management Plan approved by the Director-General, an approval under the Coal Mine Health & Safety Act 2002, or the document New Subsidence Management Plan Approval Process – Transitional Provisions (EDP09).

(d) Subsidence Management Plans are to be prepared in accordance with the Guideline for Applications for Subsidence Management Approvals.

(e) Subsidence Management Plans as approved shall form part of the Mining Operations Plan required under Condition 3 and will be subject to the Environmental Management Report process as set out under Condition 4. The SMP is also subject to the requirements for subsidence monitoring and reporting set out in the document New Approval Process for Management of Coal Mining Subsidence - Policy.

9. Working Requirement

The lease holder must:

(a) ensure that at least eight (8) competent people are efficiently employed in relation to the mining process or mining operations on the lease area

OR
12. **Prevention of soil erosion and pollution**
Prospecting operations must be carried out in a manner that does not cause or aggravate air pollution, water (including groundwater) pollution, soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan.

13. **Transmission lines, Communication lines and Pipelines**
Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions stipulated.

14. **Roads and Tracks**
   (a) The lease holder must pay to the relevant roads authority in control of the road or track the reasonable costs incurred by the roads authority in making good any damage to roads or tracks caused by operations carried out under this lease less any amount paid or payable from the Mine Subsidence Compensation Fund.
   (b) During wet weather the use of any road or track must be restricted so as to prevent damage to the road or track.
   (c) Existing access tracks should be used for all operations where reasonably practicable. New access tracks must be kept to a minimum and be positioned in order to minimise damage to the land, watercourses or vegetation.
   (d) Temporary access tracks must be rehabilitated and revegetated to the satisfaction of the Director-General as soon as reasonably practicable after they are no longer required under this lease.

15. **Trees and Vegetation**
   (a) The lease holder must not fell trees, strip bark or cut timber on any land subject of this lease without the consent of the landholder who is entitled to the use of the timber.
   (b) The lease holder must contact Forests NSW and obtain any required permit, licence or approval before taking timber from any Crown land within the lease area.
19. Security
A security in the sum of $500,000 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under this lease.

23. Suspension of Mining Operations
The holder of a mining lease may not suspend mining operations in the mining area other than in accordance with the consent of the Minister.

24. Cooperation Agreement
The lease holder must make every reasonable attempt, and be able to demonstrate their attempts, to enter into a cooperation agreement with the holder(s) of any overlapping title(s). The cooperation agreement should address but not be limited to issues such as:

- access arrangements
- operational interaction procedures
- dispute resolution
- information exchange
- well location
- timing of drilling
- potential resource extraction conflicts and
- rehabilitation issues.

Note: Exploration Reports (Geological and Geophysical)
The lease holder must lodge reports to the satisfaction of the Director-General in accordance with section 163C of the Mining Act 1992 and in accordance with clause 57 of the Mining Regulation 2010.

Reports must be prepared in accordance with Exploration Reporting: A guide for reporting on exploration and prospecting in New South Wales (Department of Industry and Investment, 2010).