



Centennial Coal

Angus Place



Longwalls 900W and 910 Rehabilitation Management Plan

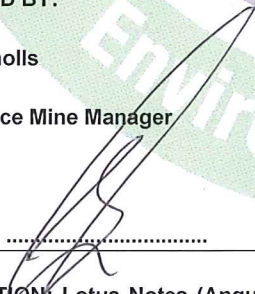
Angus Place Colliery

November 2013



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Abbreviations

| | |
|-----------------|---|
| AEMR | Annual Environmental Management Report (now known as Annual Review) |
| CCL | Consolidated Coal Lease |
| DgS | Ditton Geotechnical Services Pty Ltd |
| DP&I | NSW Department of Planning and Infrastructure |
| DTIRIS | NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy |
| EA | Environmental Assessment |
| EEC | Endangered Ecological Community |
| EPL | Environment Protection Licence |
| ESP | Exchange Sodium Percentage |
| FCNSW | Forestry Corporation of NSW |
| GNSS | Global Navigation Satellite Systems |
| LDP | Licensed Discharge Point |
| ML | Mining Lease |
| MOP | Mining Operations Plan |
| Mtpa | Million tonnes per annum |
| NOW | NSW Office of Water |
| OEH | NSW Office of Environment and Heritage |
| ROM | Run of mine |
| SCA | Sydney Catchment Authority |
| SMP | Subsidence Management Plan |
| TARP | Trigger Action Response Plan |

1. INTRODUCTION

Angus Place Colliery (Angus Place) is an underground coal mining operation located approximately five kilometres north of the village of Lidsdale, eight kilometres northeast of the township of Wallerawang and approximately 15 kilometres northwest of the city of Lithgow in the Blue Mountains region of NSW. It is bordered by Springvale Colliery to the south, Ivanhoe Colliery to the northwest and Wolgan Valley and Newnes Plateau to the north and east, respectively. The regional locality of Angus Place is shown on **Figure 1**.

Angus Place has been in operation since 1979 and is operated by Centennial Angus Place Pty Ltd, a joint venture company owned in equal share between the Centennial Coal Company Ltd and SK Kores of Korea. Secondary extraction of coal is currently undertaken at Angus Place utilising the longwall method of mining within Mining Lease (ML) 1424 and Consolidated Coal Lease (CCL) 704.

Project Approval (PA 06_0021) was granted by the then Department of Planning (now Department of Planning and Infrastructure (DP&I)) on 13 September 2006. This approval allowed for an extension of underground longwall mining operations (Longwalls 920 – 980) and an increase in run of mine (ROM) coal production to 3.5 million tonnes per annum (Mtpa). PA 06_0021 has been modified on two occasions. Modification 1 (Mod 1) was approved on 29 August 2011 and allowed for the development and extraction of two additional longwall panels (Longwall 900W and 910) as well as an increase in production limit to 4 Mtpa. Modification 2 (Mod 2) was approved in April 2013 and allowed for the development of underground roadways and the construction and operation of a Ventilation Facility (APC-VS2) and supporting infrastructure.

This *Longwalls 900W and 910 Rehabilitation Management Plan* (Rehabilitation Management Plan) has been developed in accordance with Schedule 3, Conditions 3C(g) and 37 of PA 06_0021 (as modified) and the *Draft Guidelines for the Preparation of Extraction Plans* (DP&I, 2012). Regulatory requirements applicable to the development of this Plan are outlined in **Section 4**.

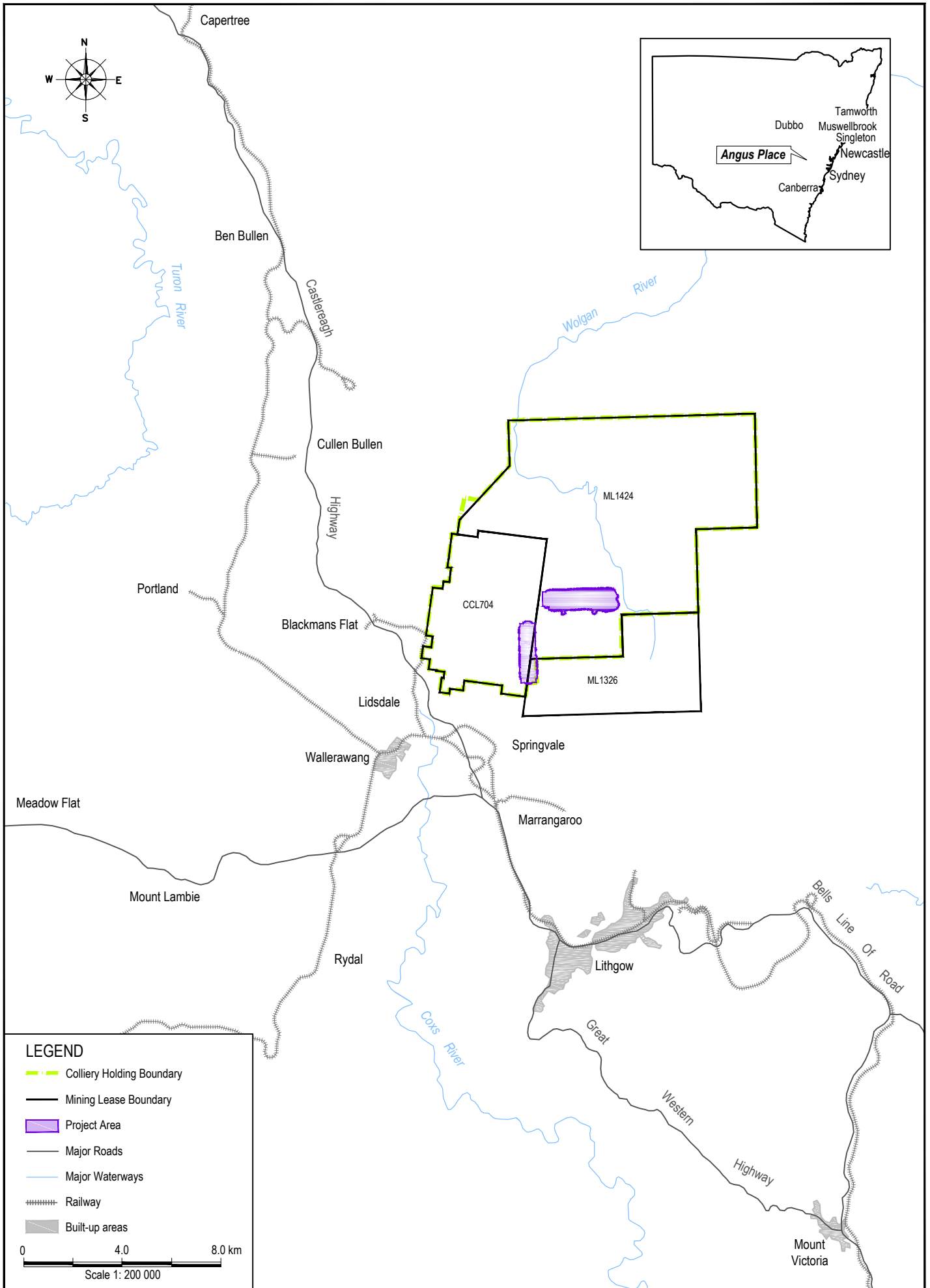
2. PURPOSE

The purpose of this Rehabilitation Management Plan is to outline the measures to be implemented to rehabilitate potential subsidence related impacts to land resulting specifically from the secondary extraction of Angus Place Longwalls 900W and 910. There is no planned vegetation clearing or direct surface disturbance within the Longwall 900W and 910 area (herein referred to as the Project Area). Subsequently, this Rehabilitation Management Plan is focussed on the remediation of potential subsidence induced surface impacts such as surface cracking, ponding, and erosion and sedimentation. Required actions and responsibilities are defined to ensure detection and remediation of any mining induced subsidence-related impacts.

3. SCOPE

This Rehabilitation Management Plan applies to the rehabilitation of land located within the Project Area. In accordance with the requirements of the *Guidelines for Applications for Subsidence Management Approvals* (2003), published by the NSW Department of Mineral Resources (now the NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DTIRIS)), this Project Area has been calculated by combining the areas bound by the following limits (see **Figure 2**):

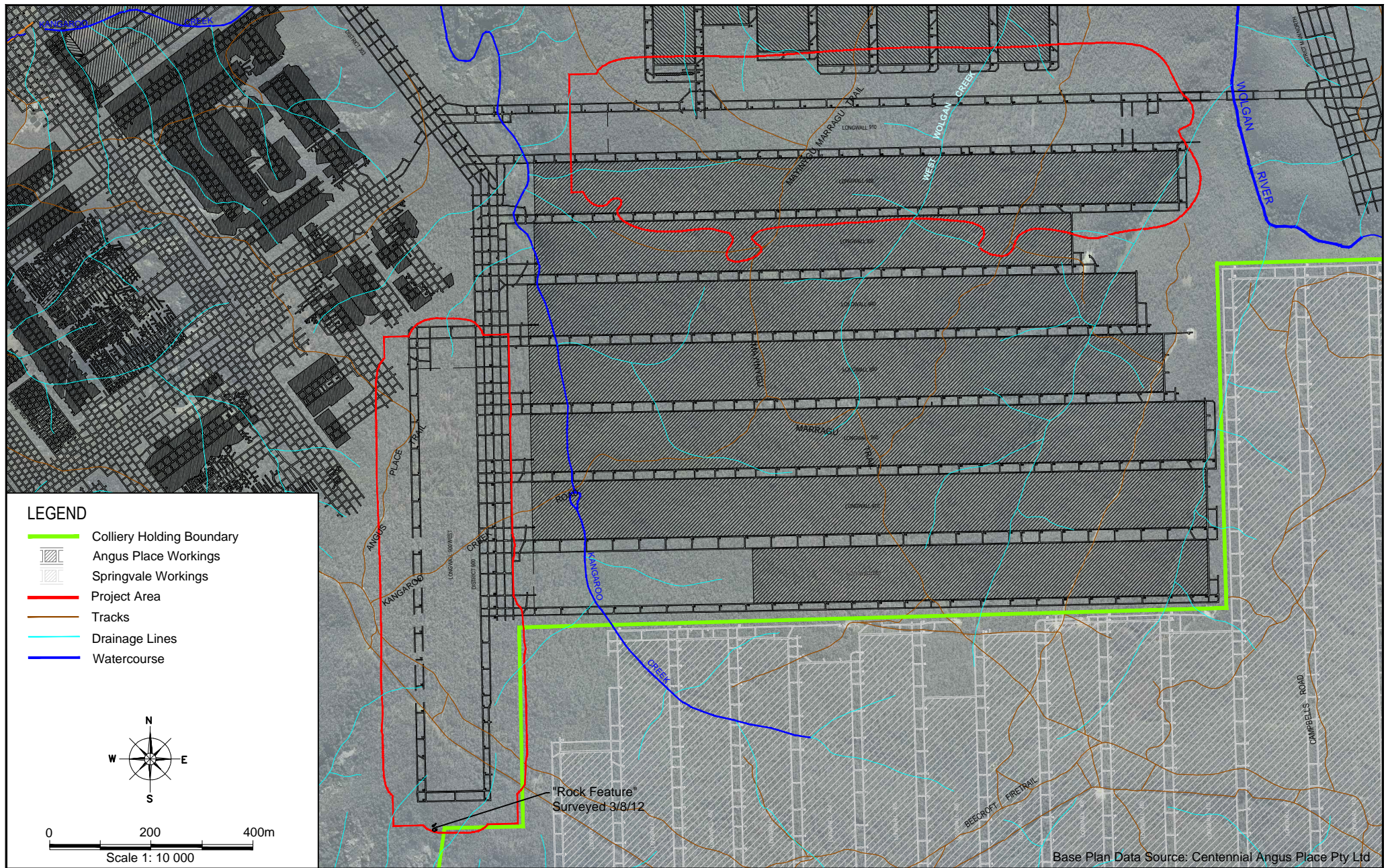
- A 26.5° angle of draw line from the limit of proposed extraction; and
- The predicted limit of vertical subsidence, taken as the 20mm subsidence contour resulting from the extraction of the Longwalls 900W and 910.



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Longwalls 900W and 910 Rehabilitation Management Plan
Regional Locality

FIGURE 1



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Longwalls 900W and 910 Rehabilitation Management Plan
 Project Area
FIGURE 2

4. REGULATORY REQUIREMENTS

4.1. Project Approval and Statement of Commitments

Project Approval PA 06_0021 (as modified) includes a number of conditions relevant to the preparation and implementation of a Rehabilitation Management Plan for the Project Area. Conditions relating specifically to the preparation of this Plan have been summarised in **Table 1**. This table also outlines the sections where these conditions have been addressed within this document.

Table 1. Relevant Project Approval Conditions

| Condition | Condition Requirement | Section Addressed |
|--------------------------|---|-------------------|
| Schedule 3, Condition 3C | The Proponent shall prepare and implement Extraction Plan/s for the second workings in Longwalls 910 and 900W to the satisfaction of the Director-General. Each Extraction Plan must: g) include the following to the satisfaction of the Executive Director Mineral Resources: <ul style="list-style-type: none"> appropriate revisions to the Rehabilitation Management Plan required under condition 37; | This document |
| Schedule 3, Condition 37 | The Proponent shall prepare and implement a Rehabilitation Management Plan for the project, to the satisfaction of the Director-General and Executive Director Mineral Resources. This plan must be: a) submitted to the Director-General for approval prior to the commencement of secondary extraction in either of longwalls 900W or 910; | This document |
| | b) prepared in consultation with DRE, Forests NSW, OEH, NOW, SCA and Council; and | Section 10 |
| | c) prepared in accordance with the relevant DRE guideline. | Section 4.3 |

Table 2 provides the details of the relevant commitment made by Angus Place in the Mod 1 Statement of Commitments, which is appended to PA 06_0021 (as modified). In accordance with Schedule 2, Condition 3 of PA 06_0021 (as modified), if there is any inconsistency between the Mod 1 Statement of Commitments and the conditions of the Project Approval, the conditions of the approval shall prevail to the extent of any inconsistency. Subsequently, Angus Place has submitted this Rehabilitation Management Plan to satisfy the Commitment 1 of the Mod 1 Statement of Commitments.

Table 2. Relevant Statement of Commitments

| Commitment | Statement of Commitment | Section Addressed |
|------------|--|-------------------|
| 1 | A Rehabilitation Strategy as set out in Appendix 7.6 and revised in relation to the measures identified for the rehabilitation of areas of construction for the dewatering bore at Longwall 910 and its associated infrastructure that have been withdrawn from the proposals of the EA will be developed for approval by the Director-General I&I NSW prior to commencement of Longwalls 910 and 900 west and within 12 months of the date of approval. | This document |

Please note that the Mod 2 Statement of Commitments, also appended to PA 06_0021 (as modified) specifically relates to the Ventilation Facility Project. On this basis, these commitments have not been addressed within this Rehabilitation Management Plan for Longwalls 900W and 910.

4.2. Mining Leases

The Project Area is associated with three mining tenements; ML 1326, ML 1424 and CCL 704. Conditions relevant to the preparation of this Rehabilitation Management Plan have been provided in **Table 3**.

Table 3. Relevant Mining Lease Conditions

| Mining Lease | Requirement | Section Addressed |
|---|--|-------------------|
| CCL 704, Condition 7 | Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director General. | Section 8.2 |
| ML 1326 Condition 29 and ML 1424 Condition 32 | The lease holder shall: j) complete work in relation to rehabilitation within the Warragamba Outer Catchment Area before termination of the authority to the satisfaction of the Authority. | Section 8.2 |

4.3. Other Guidelines

This report has generally been prepared in accordance with the requirements of the following relevant strategic land use planning and resource management plans and policies relating to mine rehabilitation and mine closure:

- EDG 03 Guidelines to the Mining, Rehabilitation and Environmental Management Process (DTIRIS, 2012)
- The Strategic Framework for Mine Closure (ANZMEC and Minerals Council of Australia, 2000);
- Best Practice Environmental Management in Mining: Landform Design for Rehabilitation (Department of Environment, 1998);
- Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia, 2006);
- Mine Closure and Completion - Leading Practice Sustainable Development Program for the Mining Industry (Federal Department of Industry, Tourism and Resources, 2002); and
- The approved *Mining Operations Plan* (MOP) (GSS Environmental, 2013).

5. RELEVANT FEATURE(S) AND PREDICTED IMPACTS

5.1. Relevant Feature(s)

All land overlying the Project Area is within the Newnes State Forest, managed by the Forestry Corporation of NSW (FCNSW) as part of a forestry enterprise. The predominant land uses within the State Forest include native hardwood harvesting and recreational activities such as bushwalking, motor cycling and four wheel drive pursuits. A number of publicly-accessible forest tracks are located within the Project Area including Kangaroos Creek Road, Beecroft Fire Trail, Mayinygu Marragu Trail and Angus Place Trail (see **Figure 2**).

As outlined in the *Surface Water Assessment* (GHD, 2010), which was prepared as part of the Mod 1 Environmental Assessment (EA) titled *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A* (RPS, 2010), there is one ephemeral drainage line located

above Longwall 910, known as West Wolgan Creek. There are two first order tributaries of Kangaroo Creek located above Longwall 900W. The locations of drainage lines associated with the Project Area are shown on **Figure 2**.

5.2. Predicted Impacts

5.2.1. Surface Cracking

As a component of the Mod 1 EA titled *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A* (RPS, 2010), Ditton Geotechnical Services Pty Ltd (DgS) prepared a *Subsidence Prediction and Impact Assessment* (DgS, 2010) which outlined the predicted subsidence related impacts associated with the proposed development and secondary extraction of Longwalls 900W and 910. In this report, DgS (2010) states surface cracking widths of between 1mm - 20mm may occur within the limits of extraction and up to 90mm where competent rock is exposed near strain peaks. It is however considered unlikely by DgS (2010) that the cracks will occur as a single crack where deep soil or weathered surface rock exists, instead presenting as several smaller width cracks. With regard to cracking of forest access tracks within the Project Area, DgS (2010) predicts that the worst case crack width is estimated to range between 20mm – 90mm. It is expected that approximately 30m – 50m long sections of the tracks above each of the longwalls may require repairs to tensile cracking or compressive shear failures through the road after each panel is completed.

Minor transient surface cracking with widths <20mm may develop behind the retreating secondary extraction face and along and across creek beds or watercourses that are undermined (DgS, 2010). Cracks that occur within the drainage gullies or creek beds may result in sub-surface re-routing of surface flows during storm periods and particularly those areas that have bedrock exposed. However, the impacts in most cases should be self-healing, due to sediment bed load that is likely to accumulate in the cracks after several storm events occur.

5.2.2. Erosion and Sedimentation

Minor surface cracking and deformation is anticipated to occur within the tributaries of Kangaroo Creek as a result of mining (DgS, 2010). However, the long term geomorphologic impacts as a result of changes to longitudinal gradients and surface cracking are expected to be negligible and therefore no consequences are expected (GHD, 2010).

There is only one ephemeral drainage line located in the Project Area, referred to as West Wolgan Creek. Based on pre and post mining terrain change analysis, the *Subsidence Prediction and Impact Assessment* (DgS, 2010) estimates that the section of West Wolgan Creek that overlies Longwall 910 would be subject to grade changes of +0.1% to -0.6%. Predictions also include additional subsidence of between 0.15m – 0.25m over Longwalls 920 and 930 as a result of the secondary extraction within Longwall 910 (DgS, 2010). The existing grade of this section of creek is relatively steep (approximately 3%) and these grade change estimates would not have a significant impact on existing erosion rates and therefore no consequences are expected (GHD, 2010).

5.2.3. Ponding

DgS (2010) predicted that some minor ponding to a depth of 0.1m may occur towards the downstream extent of the section of West Wolgan Creek overlying Longwall 910. This would potentially result in an increase from the existing depth of 0.67m to 0.72m. The estimated volume of predicted ponding based on this depth is 0.05 megalitres and the impact on flow transfers downstream is considered to be negligible (GHD, 2010).

It is also expected that the impact of increased ponding along the creek beds is likely to be contained 'in-channel' and therefore the effects upon existing flora and fauna is likely to be minimal (DgS, 2010).

5.2.4. Subsidence Assessment Review

As a component of the *Longwalls 900W and 910 Integrated SMP/Extraction Plan*, DgS completed a review of the *Subsidence Prediction and Impact Assessment* (DgS, 2010). This review was completed to satisfy the requirement of Schedule 3, Condition 3C(e) of PA 06_0021 (as modified), which requires the proponent to:

“Provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this approval.”

The report titled *Subsidence Assessment Review for the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery* (DgS, 2013), incorporated relevant information obtained by Angus Place since the approval of PA 06_0021 (Mod 1) in August 2011, including subsidence monitoring data and observed subsidence effects following the completion of secondary extraction in Longwalls 960 and 970, and a change to the mining height within Longwalls 900W and 910.

The *Subsidence Prediction and Impact Assessment* (DgS, 2010) assessed potential subsidence effects based upon a mining height of 3.25 m. Angus Place will now mine Longwalls 900W and 910 at an extraction height up to 3.425 m. This change has been assessed by DgS (2013) which concluded that *“the observed and predicted subsidence impacts and environmental consequences for LWs 960 and 970 have also been consistent with predictions for LWs 900W and 910, and as such, the predicted ‘negligible’ environmental consequences for LWs 900W and 910 are not expected to change from the previous assessment due to the 5% increase in mining height.”*

“It is therefore considered that the impact management strategies for the environment and site developments (e.g. access roads and Endeavour Energy 66kV power line) that were outlined in DgS, 2010 are still valid and do not require amendment” (DgS, 2013). The management measures as outlined in **Section 8** are consistent with the impact management strategies outlined in the *Subsidence Prediction and Impact Assessment* (DgS, 2010).

6. IDENTIFIED RISKS

On 25th July 2012 a Subsidence Management Plan (SMP) Risk Assessment was conducted to identify subsidence-related hazards that may affect the environment and community as a result of the extraction of Angus Place Longwalls 900W and 910. This risk assessment was completed in accordance with the requirements of the *Guideline for Applications for Subsidence Management Approvals* (Department of Mineral Resources, 2003) and the *Centennial Coal Risk Management Standard - Management Standard 004* (Centennial Coal, 2008).

Risks were identified and assessed through the review of known surface and sub-surface features within the Project Area. A risk ranking (low, moderate, significant, high or extreme) was assigned to each risk/hazard. There were two potential risks that related to rehabilitation identified during the SMP Risk Assessment which related to: potential for subsidence to exacerbate existing erosion along the power line corridor (moderate risk); and subsidence induced surface cracking (low risk). Although the maximum consequence for subsidence related erosion was ranked as insignificant, the moderate risk ranking was assigned due to the likelihood of this occurring (ranked as probable) as a result of subsidence along the Endeavour Energy powerline corridor. These risks and the recommended controls have been presented in **Table 4**.

Table 4. Risk to Rehabilitation

| Risk | Current Controls | Risk Ranking | Recommended Controls |
|--|---|-----------------|--|
| <p>There is a risk to Angus Place from ::: Existing erosion exacerbated along power line easement ::: Caused by: Increased slope angle due to subsidence Resulting in: Environmental impacts.</p> | <p>Water Management Plan including Erosion and Sediment Control Plan.</p> | <p>Moderate</p> | <p>Consultation with Endeavour Energy, including visual inspection of powerlines within the Power Lines Management System.</p> |
| | <p>Visual inspections documented by GSS Environmental 24/07/12.</p> | | <p>Investigate monitoring and remedial requirements with Endeavour Energy.</p> |
| <p>There is a risk to Angus Place from :::Surface cracking::: Caused by: Subsidence Resulting in: Personal Injury</p> | <p>Existing Public Safety Management Plan including:</p> | <p>Low</p> | <p>Placement of subsidence warning signs within the SMP Application Area</p> |
| | <p>Subsidence warning signs;</p> | | <p>Prepare Public Roads and Infrastructure Management Plan for SMP Application Area.</p> |
| | <p>Pre/Post mining inspections;</p> | | <p>Prepare Public Safety Management Plan for SMP Application Area.</p> |
| | <p>Subsidence TARP within SMP; and</p> | | <p>Prepare Subsidence Monitoring Program for SMP Application Area.</p> |
| | <p>Subsidence survey within SMP.</p> | | |
| | <p>Notification of relevant stakeholders.</p> | | |
| | <p>Road and Infrastructure Management Plan.</p> | | |
| | <p>High visibility caps on subsidence monitoring points.</p> | | |
| | <p>Monitoring point stakes typically 300mm from ground.</p> | | |
| | <p>Subsidence Assessment predicts surface cracking of up to 90mm.</p> | | |
| <p>Mining geometry design to minimise potential surface impact.</p> | | | |

To further mitigate subsidence-related risks requiring rehabilitation, Angus Place has implemented the ‘recommended controls’ as outlined in **Table 4**. The potential to exacerbate existing erosion along the Endeavour Energy powerline corridor is addressed in the *Powerline Management Plan* that has been prepared in consultation with Endeavour Energy. The potential impacts resulting from subsidence induced surface cracking along forest access tracks has been addressed in the *Built Features Management Plan*, while general surface cracking has been addressed in the *Public Safety Management Plan*. A *Longwalls 900W and 910 Subsidence Monitoring and Reporting Program*, as recommended in **Table 4** has also been prepared as a component of the *Longwalls 900W and 910 Integrated SMP/Extraction Plan*.

Additional detail regarding the rehabilitation of subsidence related cracking, ponding and erosion within the Project Area has been detailed in **Section 8**. Monitoring of any rehabilitation within the Project Area has been outlined in **Section 9.4.1**.

7. PERFORMANCE MEASURES AND INDICATORS

7.1. Performance Measures

Subsidence impact performance measures are specified in Schedule 3, Condition 3 of PA 06_0021 (as modified). The performance measure specifically relating to rehabilitation is:

- Damage to built features (forest access roads and tracks) must be fully repaired or replaced, or else fully compensated.

7.2. Performance Indicators

As outlined in **Section 5.2**, there is a low likelihood that there will be a requirement for Angus Place to undertake rehabilitation of subsidence induced ponding or erosion and sedimentation within the Project Area. DgS (2010) predicted that approximately 30m – 50m long sections of the tracks above each of the longwalls may require repairs to tensile cracking or compressive shear failures through the road after each panel is completed. It is expected, based upon site experience, that such remediation works will be minor in nature and will not generally require revegetation works. Accordingly, Angus Place will undertake the management/repair of all minor subsidence impacts as per the methodology outlined in **Section 8.1**. For the purpose of this Rehabilitation Management Plan, minor subsidence impacts are defined as being consistent with the predictions of the *Subsidence Prediction and Impact Assessment* (DgS, 2010) (see **Section 5.2**).

In the event that subsidence induced cracking, ponding or erosion and sedimentation within the Project Area is beyond the extent of impacts predicted by DgS (2010) and significant rehabilitation is required, Angus Place will undertake appropriate rehabilitation works (see **Section 8**) and implement the rehabilitation monitoring program outlined in **Section 9.4.1**. This monitoring program will be used to establish compliance with the performance measures outlined in **Section 7.1** and to assess the environmental performance of rehabilitation against the following performance indicators:

- Adequate condition of slopes, drainage and erosion on rehabilitation areas;
- Water management structures are safe, stable and non-polluting;
- Soil parameters adequate to sustain ecosystems;
- Vegetation communities and structure development consistent with analogue communities; and
- Water quality within the parameters of Angus Place Environmental Protection Licence (EPL) 467 and PA 06_0021.

8. REHABILITATION MANAGEMENT MEASURES

There is no planned vegetation clearing or direct surface disturbance within the Project Area, subsequently rehabilitation is expected to be limited to minor repairs of subsidence induced surface cracking, ponding, and erosion and sedimentation. The management and repair of minor subsidence related impacts within the Project Area will be undertaken as per the methodology outlined in **Section 8.1**.

In the event that subsidence induced cracking, ponding or erosion and sedimentation within the Project Area is beyond the extent of impacts predicted by DgS (2010) and significant rehabilitation is required, Angus Place will implement rehabilitation activities in accordance with the rehabilitation

management process flowchart shown in **Figure 3**. Additional detail regarding the rehabilitation management measures that will be implemented by Angus Place within the Project Area (if required) have been provided in **Sections 8.2 – 8.8**. Monitoring of rehabilitation is outlined in **Section 9.4.1**.

8.1. Management of Minor Subsidence Related Impacts

As per the recommendations of the *Subsidence Prediction and Impact Assessment* (DgS, 2010), the management measures specified in **Sections 8.1.1 – 8.1.3** will be implemented by Angus Place during the secondary extraction of Longwalls 900W and 910 to monitor and manage minor subsidence induced surface cracking, ponding and erosion within the Project Area.

The management of mining induced surface cracking, ponding and erosion and sedimentation within the Project Area will be undertaken in accordance with a Trigger Action Response Plan (TARP) for Land Management. A copy of this TARP from the *Longwalls 900W and 910 Land Management Plan* (Land Management Plan) has been provided in **Appendix 1**.

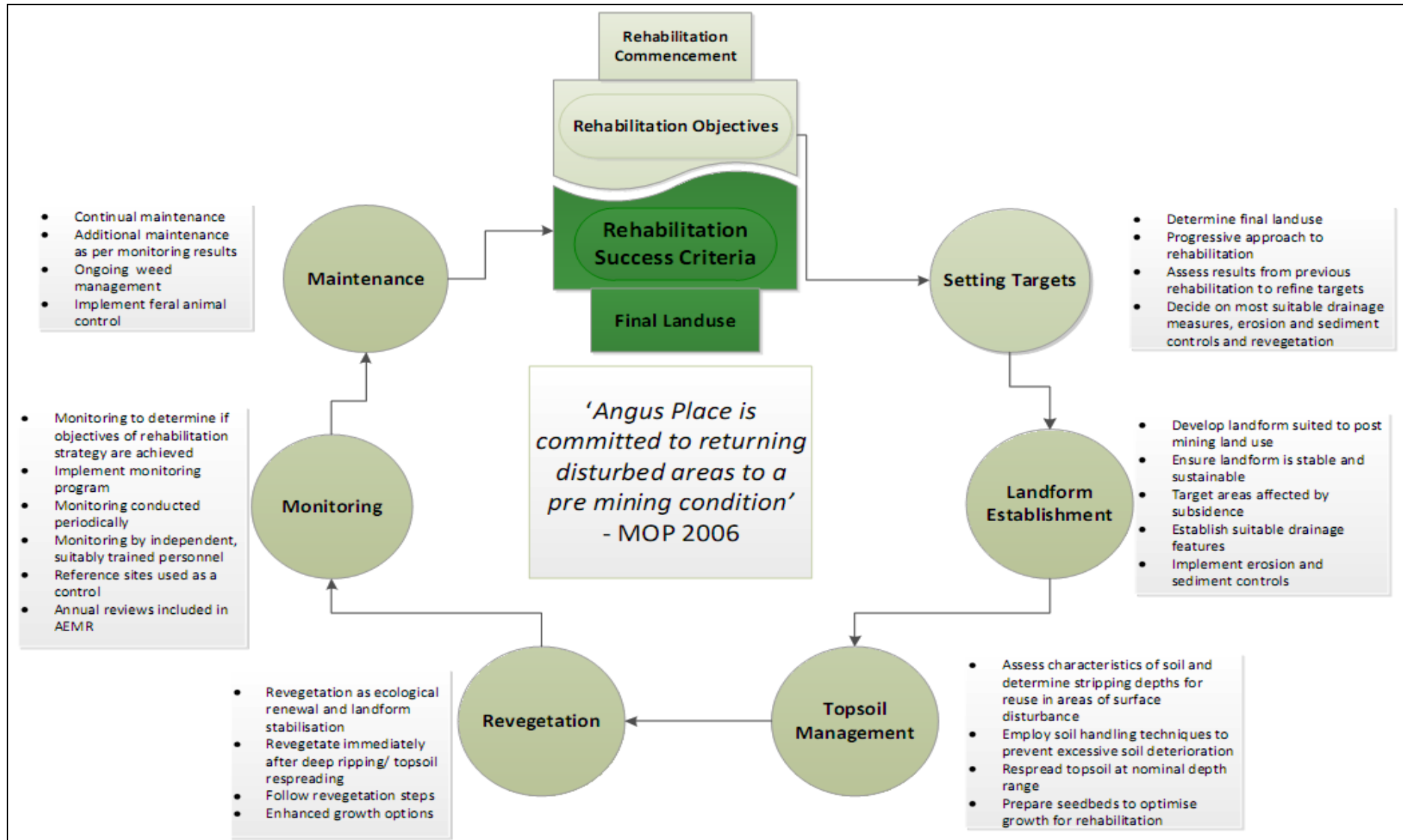


Figure 3 Rehabilitation Management Process Flowchart

8.1.1. Surface Cracking

Angus Place will implement the following management measures to manage surface cracking within the Project Area:

- Visual inspections of access tracks will be undertaken prior to, during and post secondary extraction of longwalls within the Project Area. Inspections will include photo monitoring;
- In response to observed impacts, Angus Place will erect warning signs (see **Plate 1**) or danger tape in the immediate area if the cracking is considered to be a public safety risk; and
- If rehabilitation works for surface cracks are required these will be undertaken in accordance with the methodology specified in **Section 8.5** and in consultation with FCNSW.



Plate 1. Warning Sign at Angus Place

8.1.2. Erosion and Sedimentation

The following management measures will be implemented by Angus Place to manage erosion and sedimentation within the Project Area:

- Visual inspections, including photo monitoring of West Wolgan Creek, will be undertaken prior to, during and post secondary extraction. Where possible inspections will be undertaken following rainfall events to identify evidence of erosion and sedimentation;
- Visual inspections of the Endeavour Energy powerline easement will be undertaken as agreed during the preparation of the *Powerline Management Plan*; and
- If necessary, Angus Place will implement appropriate management measures as specified in the approved *Site Water Management Plan* (Angus Place, 2012), in consultation with relevant stakeholders.

8.1.3. Ponding

Angus Place will undertake the following measures in accordance with the approved *Site Water Management Plan* (Angus Place, 2012) and the recommendations of the *Subsidence Prediction and Impact Assessment* (DgS, 2010) to monitor and manage potential ponding within the Project Area:

- Visual inspections, including photo monitoring of West Wolgan Creek, will be undertaken prior to, during and post secondary extraction. Where possible inspections will be undertaken following rainfall events to identify evidence of temporary/permanent ponding;
- If visual inspections along West Wolgan Creek identify that there is evidence of temporary/permanent ponding within the Project Area, Angus Place will undertake a review and appraisal of changes to drainage paths and surface vegetation; and
- If necessary, Angus Place will develop an appropriate management strategy in consultation with relevant NSW Government Agencies (including FCNSW).

8.2. Rehabilitation Objectives

The approved Angus Place MOP (GSS Environmental, 2013) and PA 06_0021 (as modified), set out specific rehabilitation objectives. These objectives are:

- Rehabilitation and the outcomes will be consistent with the Mod 1 EA (RPS, 2010);
- Rehabilitation will be based on mine closure criteria and outcomes developed through stakeholder consultation;
- Compliance with the relevant regulatory requirements and that regulatory consensus is attained on the successful closure and rehabilitation of the site;
- Rehabilitation of native vegetation will be integrated with undisturbed native vegetation to provide consolidated areas and wildlife corridors where possible;
- The rehabilitation area will be rehabilitated to an agreed final land use compatible with the surrounding land fabric and land use requirements;
- The rehabilitation process will address limitations of land capability that may arise as a consequence of mining;
- The rehabilitation will be sustainable in terms of selected final land use;
- The rehabilitated site will be stable with permanent landforms with soils, hydrology and ecosystems having maintenance needs no greater than those of the surrounding land;
- Waste substances that have the potential to affect land use or result in pollution will be secured and safely contained until they can be removed from site by licenced waste contractors;
- The rehabilitated site will not present a hazard to persons, stock or native fauna;
- The site will be clean and tidy and any remaining structures will be left in a condition that provides for the safety of the public; and
- Mine closure works are completed as quickly and cost effective as possible whilst providing that the above objectives are achieved.

8.3. Rehabilitation Success Criteria

Preliminary success criteria (or closure criteria) for rehabilitation areas are presented in **Table 5**. The success criteria are performance objectives or standards against which rehabilitation success in achieving a sustainable system for the proposed post-mine land use is demonstrated. Satisfaction and maintenance of the success criteria (as indicated by monitoring results) will demonstrate that the rehabilitated landscape is ready to be relinquished from the mine's financial assurance and could be handed back to stakeholders in a productive and sustainable condition.

The success criteria will be reviewed every three to five years with stakeholder participation to ensure the nominated success criteria remain realistic and achievable. Angus Place has an existing

relationship with FCNSW and therefore it is expected that the open communications will continue to facilitate agreements on rehabilitation and closure criteria.

The rehabilitation success criteria comprise indicators for landform stability, and safety on a landform-type basis that reflects the nominated post-mine land use of a mosaic of native woodland and forests. For each element, standards that define rehabilitation success at mine closure are provided. Based on the generic indicators in **Table 5**, each criterion will be further developed to be specific, measurable, achievable, realistic and outcome based, and to reflect the principle of sustainable development. This will be based on results of further research and ongoing monitoring of the progressive rehabilitation areas. Further detail regarding rehabilitation success criteria is included in the approved MOP rehabilitation table, which has been provided as **Appendix 2**.

Table 5. Preliminary Rehabilitation Success Criteria

| Rehabilitation Element | Indicator | Performance Measure | Criteria |
|------------------------|---------------------------------------|--|---|
| Landform stability | <i>Slope gradient</i> | Annual geotechnical stability inspection | Within 12-months of undertaking rehabilitation, no less than 75% of the area has slopes <10°. Where the slopes are steeper, additional water management structures will be utilised (as required). Where reject layers are present and exposed, the landform is capped with a minimum of 1.5m of inert material and be free-draining. |
| | <i>Erosion control</i> | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Within 12 months of undertaking rehabilitation: <ul style="list-style-type: none"> Erosion control structures are installed at intervals commensurate with the slope of the landform. Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion). Dimensions and frequency of occurrence of erosion rills and gullies are generally no greater than that in reference sites that exhibit similar landform characteristics. |
| | <i>Surface Water Drainage</i> | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. Annual geotechnical stability inspection | Within 12 months of undertaking rehabilitation: <ul style="list-style-type: none"> Use of contour banks and diversion drains to direct water into stable areas or sediment control basins. All landforms will be free draining except where specific structures (i.e. LDP003) have been constructed for the storage of water as required for sediment and erosion control or some post mining landuse. |
| Water quality | <i>EC, pH, TSS and oil and grease</i> | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Ensure receiving waters affected by surface water runoff have contaminant limits of the EPL at all times. |

| Rehabilitation Element | Indicator | Performance Measure | Criteria |
|------------------------|---|--|---|
| Topsoil | <i>Salinity (electrical conductivity)</i> | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Soil salinity content is <0.6 dS/m within 12 months of rehabilitation. |
| | <i>pH</i> | | Soil pH is between 5.5 and 8.5 within 12 months of rehabilitation. |
| | <i>Sodium content</i> | | Soil Exchange Sodium Percentage (ESP) is <15% within 12 months of rehabilitation. |
| | <i>Nutrient cycling</i> | | Within 12 months of rehabilitation, nutrient accumulation and recycling processes are occurring as evidenced by the presence of a litter layer, mycorrhizae and/or other microsymbionts. Adequate macro and micro-nutrients are present. |
| Vegetation | <i>Land use</i> | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Area accomplishes and remains as a healthy native woodland within 3 years prior to mine closure. |
| | <i>Surface cover</i> | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Within 3 years prior to mine closure: <ul style="list-style-type: none"> • Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present). • No bare surfaces >20 m² in area or >10 m in length down slope. |
| | <i>Species composition</i> | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure, subject to proposed land use, comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland. |

| Rehabilitation Element | Indicator | Performance Measure | Criteria |
|------------------------|----------------------------------|--|---|
| | <i>Resilience to disturbance</i> | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure: <ul style="list-style-type: none"> Established species survive and/or regenerate after disturbance. Weeds do not dominate native species after disturbance or after rain. Pests do not occur in substantial numbers or visibly affect the development of native plant species. These indicators will be at levels similar to pre-disturbance conditions. |
| | <i>Sustainability</i> | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure: <ul style="list-style-type: none"> Species are capable of setting viable seed, flowering or otherwise reproducing. Evidence of second generation of shrub and understorey species. Vegetation develops and maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons. More than 75% of shrubs and/or trees are healthy when ranked healthy, sick or dead. These indicators will be at levels similar to pre-disturbance conditions. |
| Fauna | <i>Vertebrate species</i> | Results from ecological monitoring undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure: <ul style="list-style-type: none"> Representation of a range of species characteristics from each faunal assemblage group (e.g. reptiles, birds, mammals), present in the ecosystem type, based on pre-mine fauna lists and sighted within the three-year period preceding mine closure. The number of vertebrate species does not show a decrease over a number of successive seasons prior to mine closure. |
| | <i>Invertebrate species</i> | Results from ecological monitoring undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure representatives of a broad range of functional indicator groups involved in different ecological processes are present in numbers similar to pre-disturbance conditions. |
| | <i>Habitat structure</i> | Results from ecological monitoring undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Within 3 years prior to mine closure typical food, shelter and water sources required by the majority of vertebrate and invertebrate inhabitants of that ecosystem type are present, including: a variety of food plants; evidence of active use of habitat provided during rehabilitation such as nest boxes, and logs and signs of natural generation of shelter sources including leaf litter. These indicators will be at levels similar to pre-disturbance conditions. |

| Rehabilitation Element | Indicator | Performance Measure | Criteria |
|------------------------|------------------------|--------------------------|--|
| Safety | <i>Risk assessment</i> | Risk assessment results. | Any future risk assessments to be undertaken in accordance with relevant guidelines and Australian Standards and risks reduced to levels agreed with the stakeholders. |

8.4. Final Landuse

The proposed post mining land use for the Project Area is State Forest. The final landuse and biodiversity/habitat values for this site will be consistent with surrounding vegetation communities. The appropriate rehabilitation and management techniques, as outlined in this report, when implemented post mining, will ensure land capability and forestry values are re-instated. The final landform will only consist of minor changes in topography of that which already exists on site (i.e. prior to undermining), caused by the minor subsidence levels/impacts predicted by DgS (2010) (see **Section 5.2**).

Provided that environmental controls (particularly subsidence management and erosion and sediment controls) are in place there should be no adverse effects to the Project Area or surrounding land.

8.5. Landform Establishment

The predicted maximum final subsidence from Longwalls 900W and 910 is expected to range from 0.69m - 1.47m as described in the *Subsidence Prediction and Impact Assessment* (DgS, 2010). DgS has predicted that surface cracking widths of between 1mm - 20mm may occur within the limits of extraction and up to 90mm where competent rock is exposed near strain peaks. It was however considered unlikely that the cracks would occur as a single crack, instead presenting as several smaller width cracks. DgS (2010) considered that surface crack repair works would be unlikely to be needed across the panels after mining, unless cracking develops across public access roads.

Nevertheless, should subsidence impacts occur to surface features, rehabilitation will be undertaken in accordance with the relevant management plans prepared as components of the *Longwalls 900W and 910 Integrated SMP/Extraction Plan*.

Whilst the majority of subsidence impacts should be adequately repaired naturally through sedimentation and infilling of vegetation and surface debris, rehabilitation methods for surface features may include such actions as repairing surface cracks in roads and general disturbed areas where the land surface has been cleared, or surface cracking in the natural environment, and will be undertaken as per *Best Practice for Landform Design in Rehabilitation* (Department of Environment, 1998) and *Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry* (Commonwealth of Australia, 2006).

Should cracking occur in roads or general disturbed areas, the surface will be graded and the cracks filled with sand, or other suitable material, prior to the surface being re-graded and compacted. If the area is no longer utilised, it will be deep ripped, topsoiled and appropriately revegetated, as detailed in **Section 8.7**.

Subsidence cracking on the Newnes Plateau may also occur in densely vegetated areas away from established tracks. In such instances where access by equipment is an issue, the most natural way to rehabilitate surface cracking is to place locally occurring vegetative matter above or within the cracks, hastening the natural processes that occur over a prolonged period. Appropriate materials placed in or above the cracks will be determined by the size of the cracks and the intended depth to which these materials would be used in the rehabilitation. Logs, sticks, leaf litter and local soil (ensuring a localised seed bank) could all be placed within and/or above the cracks. This form of rehabilitation would result in a natural looking rehabilitated crack that would continue to accumulate additional

natural leaf litter and debris over time. Using this method of rehabilitation would avoid additional access requirements and significant disturbance to existing natural vegetation.

8.6. Topsoil Management

Angus Place recognises the importance of appropriate soil identification, stripping, and management practices for successful rehabilitation and the achievement of the desired post-closure land use. Soil resources will be utilised to rehabilitate areas of direct surface disturbance. In the event that subsidence related impacts within the Project Area exceed the predictions outlined in the *Subsidence Prediction and Impact Assessment* (DgS, 2010) and the management of topsoil is required, it will be undertaken as outlined in **Sections 8.6.1** and **8.6.2**.

8.6.1. Topsoil Stripping and Handling

Where topsoil stripping and transportation is required, the following proposed topsoil handling techniques, as detailed in the approved MOP (GSS Environmental; 2013), would be adopted to prevent excessive soil deterioration:

- Topsoil will be maintained in a slightly moist condition during stripping; material should not be stripped in either an excessively dry or wet condition;
- Soil will be graded or pushed into windrows with excavators, graders or dozers for loading into rear dump trucks by front-end loaders. This is the preferred method because it minimises compression effects of the heavy equipment that is often necessary for economical transport of soil material;
- Scrapers will not be used to form soil stockpiles, and only loose truck dumping will be undertaken;
- The surface of soil stockpiles will be left in a coarsely textured condition in order to promote infiltration and minimise erosion until vegetation is established;
- Topsoil stockpile heights will be designed to prevent biological and structural degradation. Where appropriate clayey soils will be stored in lower stockpiles for shorter periods of time compared to soils that have a coarser texture;
- Free-draining stockpiles will be created to minimise the formation of anaerobic zones;
- Stockpiles will be formed in a “chevron” profile with batters graded to achieve slopes approaching 18°;
- Where long-term stockpiling is planned (i.e. greater than 12 months), stockpiles will be seeded and fertilised. An annual cover crop species that produce sterile florets or seeds will be sown. The annual pasture species will not persist in the rehabilitation areas but will provide sufficient competition for emerging weed species and enhance the desirable microorganism activity in the soil;
- Prior to resspreading stockpiled topsoil onto disturbed areas (particularly onto designated tree seeding areas), an assessment of weed infestation on stockpiles will be undertaken to determine if individual stockpiles require herbicide application and/or “scalping” of weed species prior to topsoil spreading, and
- Specific resspreading depths for different landforms will be optimised during rehabilitation activities.

8.6.2. Topsoil Re-spreading and Seedbed Preparation

Where possible, topsoil will be re-spread directly onto cleared/reshaped landforms. Where topsoil resources allow, topsoil will be spread to a nominal minimum depth range of 0.1m to 0.3m on all areas to be rehabilitated.

Thorough seedbed preparation will be undertaken to optimise establishment and growth of vegetation. All topsoiled areas will be lightly contour-rippled (after topsoil spreading) to create a “key” between the topsoil and the subsoil. Ripping will be undertaken on the contour and the tynes lifted for

approximately 2 m every 200 m to reduce the potential for channelised erosion on slopes greater than 10°. Ripping will be undertaken when soil is moist and immediately prior to sowing for best results. The respread topsoil surface will be scarified prior to or during seeding to reduce runoff and increase infiltration.

For areas requiring long duration topsoil stockpiling opportunities will be investigated for the application of additional ameliorants (e.g. biosolids) to assist with the regeneration of the desirable microorganism activity in the soil.

8.7. Revegetation

Endemic species mixes should be utilised where possible for revegetation, based on the species list provided in the *Flora and Fauna Assessment* (RPS, 2010a). A copy of the Flora Species List from this assessment has been provided as **Appendix 3**. Fertiliser will be applied with mixes where appropriate to increase the likelihood of initial revegetation success, however prior to application approval will be required from the land owner (that being FCNSW). The type, application rate, and concentration of the fertiliser used will be confirmed by a rehabilitation consultant before it is applied. Slow release fertilisers that have been designed for native species will be used preferentially, and sourced from licenced suppliers.

All revegetation operations are best undertaken immediately after ripping so that the ripped surface has minimal time to crust prior to seed application. The most effective way of controlling erosion will be to establish and/or maintain a healthy vegetation cover. Vegetation will provide effective surface protection against raindrop impact, bind the underlying soil to resist detachment by surface flows, and improve and maintain the soil's infiltration capacity thereby decreasing the velocity and volume of runoff. Vegetation will also improve the aesthetic appearance of each area and the operational efficiency of structural sediment and erosion control measures employed. The main revegetation steps will therefore include:

- Species selection;
- Sowing rates and species proportions;
- Seed pre-treatment;
- Equipment selection;
- Soil amelioration and fertiliser; and
- Timing.

Should natural revegetation require acceleration, the following rehabilitation methods and techniques will be implemented depending on the requirements. These include:

- Use of mulch for soil protection;
- Use of brush matting to import seed into cleared areas;
- Use of open weave jute mesh pegged in with steel pegs;
- Brush harvesting from nearby areas; and
- Ripping of compacted wheel tracks.

The overall prescribed sowing rate is 7.5 kilograms per hectare (kg/ha) of mixed seed, with seed pre-treated where appropriate. Fertiliser (Granulock 15) will be mixed with seed at 100 kg/ha. Where possible the seed will be sourced or collected from plants within the Blue Mountains area. To improve the success of rehabilitation, fast growing pasture species will be sown to obtain initial ground coverage.

As stated in the approved *Site Water Management Plan* (Angus Place, 2012), a rapid growing and healthy annual pasture sward would provide sufficient competition to minimise the emergence of undesirable weed species. The annual pasture species would not persist in the rehabilitation areas

but will provide sufficient competition for emerging weed species and enhance the desirable micro-organism activity in the soil.

8.8. Rehabilitation Maintenance

Areas of completed rehabilitation will be regularly inspected and assessed against rehabilitation objectives in consultation with FCNSW. Typically, rehabilitation monitoring will occur quarterly for the first 12 months after establishment and then every 12 months thereafter. The rehabilitation monitoring schedule is presented in **Section 9.4.1**. Rehabilitation monitoring will assess the following key aspects:

- Evidence of any erosion or sedimentation;
- Species composition;
- Vegetation cover and health;
- Soil quality;
- Availability and variety of habitat;
- Surface and groundwater quality;
- Success of initial establishment of crop or grass cover and tree and shrub seeding/plantings;
- Natural regeneration of native species;
- Weed infestation (primarily noxious weeds, but also where rehabilitation areas are dominated by other weeds); and
- Integrity of graded banks, diversion drains, waterways and sediment control structures; and
- General stability of the rehabilitation areas.

In accordance with Schedule 3, Condition 39(c) of PA 06_0021 (as modified), specific criteria used to monitor and assess rehabilitation have been included in **Section 8.3**. Where rehabilitation success appears limited, maintenance works will be undertaken. This may include the following:

- Re-seeding and, where necessary, re-topsoiling and/or the application of specialised treatments such as composted mulch or biosolids to areas with poor vegetation establishment;
- Installation of tree guards around planted seedlings or construction of temporary fencing suitable for excluding native and feral fauna species should grazing by animals be excessive;
- Replacement of drainage controls if they are found to be inadequate for their intended purpose, or compromised by vegetation or wildlife;
- De-silting or repair of sediment control structures; and/or
- Where monitoring indicates the presence of excessive weeds or the potential for noxious weed infestation, necessary precautions to prevent the development of weeds within the rehabilitated areas will be undertaken, such as undertaking hand removal and weed spraying programs, as detailed in **Section 8.8.1**.

Monitoring results, along with any required maintenance activities and refinements of rehabilitation techniques will be reported in the site's Annual Environmental Management Report (AEMR)/Annual Review.

8.8.1. Weed Management

The presence of weed species has the potential to have a major impact on revegetation and regeneration outcomes. Additionally, any presence of weed species within the surrounding land has the potential to significantly impact on the biodiversity value of the rehabilitated areas. Weed management will be a critical component of rehabilitation activities. Flora monitoring data for species present on the Newnes Plateau (including weed species) has been collected by Angus Place since 2004. This data can be used as baseline data to establish pre-disturbance conditions for subsidence cracking areas. Results from the 2012 flora monitoring found that weed species were generally rare in

the Newnes Plateau Endangered Ecological Communities (EECs), with *Hypochaeris radicata* being the most often encountered. Other weed species recorded were *Cirsium vulgare*, *Holcus lanatus* and *Sonchus* spp. Species identified in the *Flora and Fauna Assessment* (RPS, 2010) prepared as part of the Mod 1 EA included *Hypochaeris glabra*, *Hypochaeris radicata*, and *Centaureum erythraea*.

Weeds will be managed at Angus Place through a series of control measures, including:

- Hosing down equipment in an approved wash down area before entry to site;
- Herbicide spraying (in consultation with FCNSW) or scalping weeds from topsoil stockpiles prior to re-spreading topsoil;
- Inspections to identify potential weed infestations; and
- Identifying and spraying existing weed populations on-site together with ongoing weed spraying over the life of the mine.

The spread of declared noxious weeds will be prevented by using the measures above. The monitoring and control of weed populations using herbicides within the site will significantly reduce weed infestations. Weed control, if required, will be undertaken in a manner that will minimise soil disturbance. Any use of herbicides will be carried out in accordance with the regulatory requirements. Records will be maintained of weed infestations and control programs will be implemented according to best management practice for the weed species concerned.

Monitoring of weeds in rehabilitation areas will be undertaken quarterly during the first two years and biennially after that. Inspections will be opportunistic after significant rainfall events, and will monitor species identity, the approximate numbers/level of infestation, and the observations of any impacts to rehabilitation.

8.8.2. Feral Animal Control

Fauna monitoring at Angus Place is undertaken by an experienced ecology consultant in accordance with the approved *Flora and Fauna Management Plan*. Current fauna monitoring methodologies utilised on the Newnes Plateau (including pest species) include hair tubes, spotlighting, nocturnal call playback, remote cameras, diurnal bird censuses, bat echolocation recording, heptofauna searches, camera traps, secondary indications and incidental observations. A combination of these methods will continue to be used by Angus Place on the Newnes Plateau, where appropriate, following rehabilitation. Inspections will be opportunistic and will monitor species identity, the approximate numbers/level of species abundance, and the observations of any impacts of pest species to rehabilitation. Feral animal control measures will be undertaken in accordance with the *Pest Management Plan*.

Currently at Angus Place, pest management is not considered a significant environmental risk, and no pest management activities are deemed necessary. Notwithstanding, a *Pest Management Strategy* exists for the site and outlines the management of feral animals on site. Pest management methodologies that may be implemented as required to prevent detrimental impacts on rehabilitation on the Newnes Plateau include ground baiting, trapping, shooting, and strategic aerial control programs. Goats, foxes, cats, rabbits, pigs and dogs will be controlled in accordance with Livestock Health and Pest Authority procedures.

In order to assess success with the above described rehabilitation management program, Angus Place has prepared a *Rehabilitation Monitoring Program* (see **Section 9.4.1**) and rehabilitation success criteria (see **Section 8.3**).

9. MONITORING PROGRAM

9.1. Baseline Monitoring

Baseline monitoring of the Project Area will be undertaken prior to the commencement of secondary extraction within Longwalls 900W and 910 respectively. Baseline data will be obtained by Angus Place through:

- A visual inspection program undertaken by Angus Place that includes the use of photo monitoring points prior to the commencement of secondary extraction in Longwalls 900W and 910 to establish the pre-mining condition of significant features within and in close proximity to the Project Area (e.g. forest tracks and West Wolgan Creek).

No rehabilitation monitoring or subsequent data analysis is currently required to be undertaken at Angus Place due to the minor nature of subsidence impacts and ongoing utilisation of pit top facilities.

9.2. Monitoring Subsidence Impacts

Significant features within and in close proximity to the Project Area such as forest tracks and West Wolgan Creek will be monitored pre and post mining for evidence of any subsidence related impacts such as surface cracking, ponding or erosion and sedimentation. **Table 6** provides a summary of the subsidence monitoring program that will be undertaken to manage these features. Additional detail pertaining to subsidence monitoring methodology relevant to the Project Area can be found in the *Longwalls 900W and 910 Subsidence Monitoring and Reporting Program*.

Table 6. Subsidence Monitoring Program

| Monitoring Method | Parameter | Frequency |
|--|---|--|
| Subsidence survey lines | Subsidence, tilt, strain and angle of draw | Prior and post secondary extraction within Longwalls 900W and 910 |
| Global Navigation Satellite Systems (GNSS) stations | Subsidence and angle of draw | Prior and post secondary extraction in Longwall 910 |
| Visual inspections (including photo monitoring) of access tracks | Presence or absence of damage | Monthly during secondary extraction within 500m of Longwalls 900W and 910. Inspections will continue for four consecutive months following the completion of secondary extraction within Longwalls 900W and 910. A final inspection will be undertaken 12 months after the completion of secondary extraction within Longwall 900W and 910 |
| Visual inspections (including photo monitoring) of West Wolgan Creek | Presence or absence of temporary/permanent ponding and/or erosion | Monthly during secondary extraction within 500m of Longwalls 900W and 910. Inspections will continue for four consecutive months following the completion of secondary extraction within Longwalls 900W and 910. A final inspection will be undertaken 12 months after the completion of secondary extraction within Longwall 900W and 910 |

9.3. Monitoring Environmental Consequences

Angus Place will implement the monitoring program as specified in **Table 6** to monitor the development of predicted subsidence related environmental impacts (see **Section 5.2**). A TARP has been developed as a component of the *Land Management Plan* to outline management measures that will be implemented in the event that predicted environmental consequences are exceeded (see **Appendix 1**).

In the event that significant rehabilitation of subsidence induced surface cracking, ponding or erosion and sedimentation within the Project Area is required, rehabilitation will be managed in accordance with the *Rehabilitation TARP* provided in **Section 12**.

9.4. Success of Remediation Measures

In the event that remediation of minor subsidence induced cracking, ponding or erosion and sedimentation is required, Angus Place will undertake rehabilitation in consultation with relevant NSW Government Agencies (including the FCNSW). During consultation and prior to implementation of any remedial measures, Angus Place will determine the ongoing monitoring requirements.

In the event that significant rehabilitation of subsidence induced surface cracking, ponding or erosion and sedimentation is required within the Project Area (for subsidence impacts beyond the predictions of the *Subsidence Prediction and Impact Assessment* (DgS, 2010)), rehabilitation monitoring will be undertaken as outlined in **Section 9.4.1**.

9.4.1. Rehabilitation Monitoring

In the event that significant rehabilitation is required within the Project Area, regular monitoring will be required during the initial vegetation establishment period and beyond to demonstrate whether the objectives of the rehabilitation strategy are being achieved and whether a sustainable, stable landform has been provided. **Table 7** presents the recommended monitoring program, as provided in the approved MOP, including the specific aspects and elements to be monitored and monitoring frequencies for those various aspects.

Landform stability and drainage will be monitored through geotechnical stability inspections to assess slope gradients and ensure all landforms are free-draining (except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse).

Rehabilitation methods will be improved as additional knowledge develops from monitoring data collected through these programs. More specifically, monitoring of the elements in the rehabilitation monitoring program will be undertaken to determine the level of achievement of success criteria. Monitoring for each element in **Table 7** will continue at the specified frequency until the success criteria in **Table 5** have been reached.

Table 7. Rehabilitation Monitoring Program

| Aspect of Rehabilitation | Elements to be Monitored | Monitoring Frequency |
|--------------------------|--|--|
| Ecosystem Establishment | | |
| General Description | <ul style="list-style-type: none"> Describe the vegetation in general terms, e.g. mixed eucalypt woodland with grass understorey and scattered shrubs, dense Acacia scrub, etc. | Quarterly for the first 12 months after establishment and then every 12 months |

| Aspect of Rehabilitation | Elements to be Monitored | Monitoring Frequency |
|---------------------------|---|--|
| 2m x 2m quadrats | <ul style="list-style-type: none"> • Count the number of plants of all species, excluding grass • Measure live vegetation cover for understorey and grasses (separately) using a line intercept method • Record details of ground cover (litter, logs, rocks etc.) • Record details of survival of any planted seedlings (species, survival rates, growth rates). • Record detail of any seed establishment (germination rates, species emerging, from planted seed or the seed bank). | Quarterly for the first 12 months after establishment and then every 12 months |
| 20m x 10m plots | <ul style="list-style-type: none"> • Count, by species, all trees >1.6m tall. • Tag and measure DBH of trees >1.6m tall, to a maximum of 10 for any one species. • Record canopy cover over the whole 20m centreline when trees are tall enough • Subjectively describe tree health, by species if relevant, noting signs of drought stress, nutrient deficiencies, disease and severe insect attack. Where health problems are noted, record the percentage of unhealthy trees. • Record any new plant species not present in the smaller plots, including any problem and declared noxious weeds • Take five surface soil samples (e.g. at approx. 5m intervals along the centreline) and bulk these for analyses of: pH, EC, chloride and sulfate; exchangeable Ca/Mg/K/Na; cation exchange capacity; particle size analysis and R1 dispersion index; 15 bar and field capacity moisture content; organic carbon; total and nitrate nitrogen; total and extractable phosphorus; Cu, Mn and Zn. | Quarterly for the first 12 months after establishment and then every 12 months |
| 50m transect | <ul style="list-style-type: none"> • Along the 50m erosion monitoring transect, record the location, number and dimension of all gullies >30cm wide and/or 30cm deep. • Erosion pins should be established in plots located in newer rehabilitation to record sheet erosion if present | 1 year after establishment and then every 2 years |
| Rehabilitation in general | <ul style="list-style-type: none"> • When traversing between monitoring plots, note the presence of species of interest not previously recorded (e.g. key functional or structural species, protected species, noxious weeds), as well as obvious problems including any extensive bare areas (e.g. those greater than 0.1ha). • Observations such as this can provide useful, broad scale information on rehabilitation success and problems. | Quarterly for the first 12 months after establishment and then every 12 months |
| Photographic record | <ul style="list-style-type: none"> • For each 20m x 10m plot, a photograph should be taken at each end of the plot, along the centreline looking in. | Quarterly for the first 12 months after establishment and then every 12 months |

| Aspect of Rehabilitation | Elements to be Monitored | Monitoring Frequency |
|--------------------------|--|--|
| Habitat | <ul style="list-style-type: none"> General observations relating to the availability and variety of food sources (e.g. flowering/fruited trees, presence of invertebrates etc). Availability and variety of shelter (e.g. depth of leaf litter, presence of logs, hollows etc.). Presence/absence of free water in the rehabilitated areas | Quarterly for the first 12 months after establishment and then every 12 months |
| Fauna | <ul style="list-style-type: none"> General observations of vertebrate species (including species of conservation significance). Detailed fauna surveys including presence and approximate abundance and distribution of vertebrate species (focussing on species of conservation significance). | After rehabilitation is 3 years old undertake monitoring biennially in both Autumn and Spring |
| Invertebrate | <ul style="list-style-type: none"> Diversity and abundance of present species | Bi-annually, during Autumn and Spring |
| Weeds and pests | <ul style="list-style-type: none"> Species identity. Approximate numbers/level of infestation. Observations of impact on rehabilitation (if any). | Quarterly during the first two years and biennially after that. Inspections should be opportunistic after significant rainfall events. |
| Geotechnical Stability | | |
| | <ul style="list-style-type: none"> Assessment of the stability of batters and also looking at surface settlements (sink holes). In particular where these features could impact on the performance of any surface water management system. Surface integrity of landform cover/capping (measurement of extent of integrity failure). Presence / absence of landform slumping. | Annually |
| Surface and Groundwater | | |
| | <ul style="list-style-type: none"> Groundwater quality and depth. Efficiency of landform surface water drainage systems (integrity of banks and drains) Water quality including pH, EC and total suspended solids of water in water storages, and pits, sedimentation dams. | Quarterly or following rainfall events Monitoring of receiving waters |

10. CONSULTATION

This Rehabilitation Management Plan for Longwalls 900W and 910 was submitted to the DTIRIS, FCNSW, Office of Environment and Heritage (OEH), NSW Office of Water (NOW), Sydney Catchment Authority (SCA) and Lithgow City Council as part of the consultation process on 15 November 2013. Evidence of this consultation has been provided as **Appendix 4**. Following consultation this Rehabilitation Management Plan will be submitted to the DP&I for approval.

In accordance with the requirements of ML 1326 and ML 1424, Angus Place will complete rehabilitation works within the Warragamba Outer Catchment Area in consultation with the SCA.

11. ADAPTIVE MANAGEMENT

Angus Place has developed an adaptive management approach that is designed to avoid repetition of any poor rehabilitation outcomes. This approach will include the monitoring and periodic evaluation of environmental consequences against the performance indicators defined in **Section 7.2**; the implementation of the contingency plan (see **Section 12**) in the event that a performance indicators are exceeded; and the review of this Rehabilitation Management Plan as necessary (see **Section 15**).

12. CONTINGENCY PLAN

A TARP for rehabilitation has been developed to identify required management actions in the event of impacts specifically to rehabilitation areas, or where rehabilitation outcomes are not achieved in an acceptable timeframe. Where necessary, rehabilitation procedures will be amended accordingly with the aim of continually improving rehabilitation standards.

The TARP is provided as **Table 8**, and will be reviewed and revised (as required) as conditions at Angus Place change or new risks to rehabilitation are identified.

Table 8. Trigger Action Response Plan for Rehabilitation

| Aspect/ Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|---------------------|------------------------|------------------|--|---|--|
| Landform stability | Slope gradient | Trigger | At least 75% of the rehabilitation area to have slopes <10°. | <65% of the rehabilitation area has slopes <10°. | <55% of the rehabilitation area has slopes <10°. |
| | | Response | No response required. Continue monitoring program. | Undertake regrading and revegetation of the area. | Undertake a review of the landform design, including survey if required. Undertake regrading and revegetation of the area. Notify DTIRIS and relevant stakeholders. |
| | Erosion control | Trigger | Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion). | Average soil loss per annum is >40 tonnes/ha/yr (sheet erosion). | Average soil loss per annum is >50 tonnes/ha/yr (sheet erosion). |
| | | Response | No response required. Continue monitoring program. | An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to install water management infrastructure to address soil loss. Remediate as appropriate. | Engage a consultant to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the soil loss. Remediate as soon as practicable. Notify DTIRIS and relevant stakeholders. |
| | | Trigger | Dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in reference sites that exhibit similar landform characteristics. | Dimensions and frequency of occurrence of erosion rills and gullies are <20% greater than that in reference sites that exhibit similar landform characteristics. | Dimensions and frequency of occurrence of erosion rills and gullies are >20% greater than that in reference sites that exhibit similar landform characteristics. |
| | | Response | No response required. Continue monitoring program. | An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to install water management infrastructure to address soil loss. Remediate as appropriate. | Engage a consultant to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the soil loss. Remediate as soon as practicable. Notify DTIRIS and relevant stakeholders. |
| | Surface water drainage | Trigger | All landforms will be free draining (except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse). | Landforms exhibiting minor drainage issues. | Landforms exhibiting significant drainage issues. |
| | | Response | No response required. Continue monitoring program. | An inspection of the site will be undertaken by a suitably trained person. Investigate opportunities to install water management infrastructure to address soil loss from rehabilitation areas. Remediate as appropriate. | Engage a consultant to assist with the management of erosion and sedimentation at the site and provide recommendations to appropriately remediate the soil loss. Remediate as soon as practicable. Notify DTIRIS and relevant stakeholders. |

| Aspect/ Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|---------------------|---------------|---------------------|---|--|---|
| Vegetation | Land use | Trigger | Rehabilitation area accomplishes and remains as a healthy native woodland/grassland. | Six months following revegetation works, less than 80% of the rehabilitation area accomplishes and remains as a healthy native woodland/grassland. | Less than 50% of the rehabilitation area accomplishes and remains as a healthy native woodland/grassland. |
| | | Response | No response required. Continue monitoring program. | Investigate use of appropriate management options to remediate. | An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Remediate as appropriate. Notify DTIRIS and relevant stakeholders. |
| | Surface cover | Trigger | Six months following revegetation works, a minimum of 70% vegetative cover is present within rehabilitation areas (or 50% if rocks, logs or other features of cover are present). | Minimum of 60% vegetative cover is present within rehabilitation areas. | Minimum of 50% vegetative cover is present within rehabilitation areas. |
| | | Response | No response required. Continue monitoring program. | Review procedures where required to increase vegetation cover. | An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Remediate as appropriate. Notify DTIRIS and relevant stakeholders. |
| | | Trigger | Six months following revegetation works, no bare surfaces >20 m ² in area or >10 m in length down slope within rehabilitation areas. | Bare surfaces >20 m ² in area or >10 m in length down slope within rehabilitation areas. | Bare surfaces >30 m ² in area or >20 m in length down slope within rehabilitation areas. |
| | | Response | No response required. Continue monitoring program. | Review procedures where required to increase vegetation cover. | An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Remediate as appropriate. Notify DTIRIS and relevant stakeholders. |

| Aspect/ Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|---------------------|---------------------------|---------------------|--|---|---|
| | Species composition | Trigger | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland. | Six months following revegetation works, species composition shows less than 75% of species are native trees, shrubs and grasses representative of regionally occurring woodland. | Species composition shows less than 50% of species are native trees, shrubs and grasses representative of regionally occurring woodland. |
| | | Response | No response required. Continue monitoring program. | Engage weed management contractor to remove introduced species from the site. | Engage weed management contractor to remove introduced species from the site as soon as practicable. Investigate management measures to assist native plant establishment including use of ameliorants and implement as appropriate. Notify DTIRIS and relevant stakeholders. |
| | Resilience to disturbance | Trigger | Established species survive and/or regenerate after disturbance. | Minor occurrences of established species do not survive and/or regenerate after disturbance. | Significant numbers of established species do not survive and/or regenerate after disturbance. |
| | | Response | No response required. Continue monitoring program. | Review procedures where required to increase resilience to disturbance. | An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Undertake management measures and revegetation as soon as practicable. Notify DTIRIS and relevant stakeholders. |
| | | Trigger | Weeds do not dominate native species after disturbance or after rain. | Weeds dominate native species (>30%) after disturbance or after rain. | Weeds dominate native species (>50%) after disturbance or after rain. |
| | | Response | No response required. Continue monitoring program. | Engage weed management contractor to remove introduced species from the site. | Engage weed management contractor to remove introduced species from the site as soon as practicable. Investigate management measures to assist native plant establishment including use of ameliorants and implement as appropriate. Notify DTIRIS and relevant stakeholders. |

| Aspect/ Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|---------------------|----------------|---------------------|--|--|--|
| | | Trigger | Pest numbers are comparable to baseline data or visibly affect the development of native plant species. | Pest numbers increase by <15% and visibly affect the development of native plant species in rehabilitation areas. | Pest numbers increase by >15% and significantly affect the development of native plant species in rehabilitation areas. |
| | | Response | No response required. Continue monitoring program. | Increase the intensity of the current program of pest management and monitoring. | Engage pest management contractor to assist with managing high numbers of pests from the site as soon as practicable. Consider options for implementing a joint pest management program with surrounding collieries/land users. Notify DTIRIS and relevant stakeholders. |
| | Sustainability | Trigger | Six months following revegetation works, species are capable of setting viable seed, flowering or otherwise reproducing. Evidence of second generation of shrub and understorey species. | Most species are observed to be setting viable seed, flowering or otherwise reproducing. Minor evidence of second generation of shrub and understorey species. | Rare occurrences of species are observed to be setting viable seed, flowering or otherwise reproducing. Little to no evidence of second generation of shrub and understorey species. |
| | | Response | No response required. Continue monitoring program. | Review procedures where required to increase vegetation health. | Engage a consultant to undertake an inspection and provide recommendations to appropriately address issues. Implement management measures as soon as practicable. Notify DTIRIS and relevant stakeholders. |
| | | Trigger | Six months following revegetation works, more than 75% of shrubs and/or trees within rehabilitation areas are healthy when ranked healthy, sick or dead. | Less than 65% of shrubs and/or trees within rehabilitation areas are healthy when ranked healthy, sick or dead. | Less than 55% of shrubs and/or trees within rehabilitation areas are healthy when ranked healthy, sick or dead. |
| | | Response | No response required. Continue monitoring program. | Review procedures where required to increase vegetation health. | An inspection of the site will be undertaken by a suitably trained person. Investigate use of appropriate management options to remediate. Undertake management measures as soon as practicable. Revegetate if necessary. Notify DTIRIS and relevant stakeholders. |

13. ROLES AND RESPONSIBILITIES

The responsibility for implementation, monitoring and review of the Rehabilitation Management Plan lies with the Angus Place Environment and Community Coordinator. The ultimate responsibility for the implementation of the Rehabilitation Management Plan lies with the Mine Manager, who shall make appropriate resources available. The roles and responsibilities for this Rehabilitation Management Plan are outlined in **Table 9**.

Table 9. Key Personnel and Accountabilities

| Position | Responsibility |
|---------------------------------------|---|
| Mine Manager | <ul style="list-style-type: none"> • Ensuring that sufficient resources are available to implement and execute the requirements of this Plan; and • Reporting triggers/non-conformances to external stakeholders. |
| Environment and Community Coordinator | <p>Implementation, monitoring and review of this plan, including:</p> <ul style="list-style-type: none"> • The carrying out of inspections; • The installation and maintenance of signage; • Reporting triggers/non-conformances internally to the Mine Manager as appropriate; • Consulting with stakeholders on any issues arising from subsidence; • Consultation during the review process with relevant stakeholders and distributing this Rehabilitation Management Plan; • Coordinating any remediation work as required; • Inspecting areas susceptible to tensile and compressive strains and potential cracking; • Co-ordinating the generation and submission of formal reporting requirements outlined in this plan (e.g. End of Panel Reports and the AEMR/Annual Review); and • Reviewing this Rehabilitation Management Plan. |

14. REPORTING

In accordance with the requirements of the *Draft Guidelines for the Preparation of Extraction Plans* (DP&I 2012), Angus Place will submit the following reports to the DP&I and DTIRIS during the secondary extraction of Longwalls 900W and 910:

- Bi-monthly Subsidence Impact Reports - These reports will be submitted following the regular monthly inspections if any new subsidence impacts are identified; and
- Six-monthly Environmental Monitoring Report - This report will include:
 - a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP and any proposed actions resulting from the relevant TARP (see **Section 12**);
 - an assessment of compliance with relevant performance indicators (see **Section 7.2**); and
 - a comprehensive summary of all quantitative and qualitative environmental monitoring results.

The Annual Environmental Management Report (AEMR)/Annual Review will be made available on the Centennial Coal website and will include subsidence monitoring results, performance against subsidence predictions and identification of any subsidence related environmental impacts identified during the reporting period.

In accordance with the requirements of Schedule 5, Condition 6 of PA 06_0021 (as modified), Angus Place will notify the Director-General of DP&I, FCNSW and any other relevant agencies of any land management related incident, resulting from the extraction of Longwalls 900W and 910 as soon as practicable after becoming aware of the incident. Within seven days of the incident, the Proponent shall provide the Director-General of DP&I and any relevant agencies with a detailed report on the incident.

Angus Place will also prepare an End of Panel Report to encompass all environmental and subsidence monitoring, including a comparison of actual impacts with predicted subsidence impacts. This report will be submitted to DTIRIS within three months of secondary extraction being completed in each longwall panel.

15. REVIEW

This Rehabilitation Management Plan will be reviewed every three years, or in the event that the following occur:

- Stakeholders raise issues that necessitate a review;
- There are changes to the management requirements (e.g. if there are changes to related approvals);
- Where unpredicted impacts or consequences have required implementation of contingency actions under this plan; or
- Monitoring, incident, or audit processes demonstrate that a review is warranted.

Any amendments to the Rehabilitation Management Plan will be undertaken in consultation with relevant stakeholders, and a copy of the amended Rehabilitation Management Plan will be forwarded to the Director-General of the DP&I for approval.

16. REFERENCES

- Angus Place (2012) *Angus Place Site Water Management Plan*.
- ANZMEC and Minerals Council of Australia (2000) *The Strategic Framework for Mine Closure*.
- Centennial Coal (2008). *Centennial Coal Risk Management Standard (Management Standard – 004)*.
- Commonwealth of Australia (2006) *Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry*.
- DgS (2010) *Subsidence Prediction and Impact Assessment for the Proposed Longwall Panels 910 and 900 West at Angus Place Colliery, Lidsdale*. DgS Report No. ANP-002/1.
- DgS (2013) *Subsidence Assessment Review for the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery*.
- Department of Environment (1998) *Best Practice Environmental Management in Mining: Landform Design for Rehabilitation*.
- Department of Mineral Resources (2003). *Guideline for Applications for Subsidence Management Approvals*.
- DP&I (2012) *Draft Guidelines for the Preparation of Extraction Plans*.
- Federal Department of Industry, Tourism and Resources (2002) *Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion*.
- GHD (2010) *Angus Place Colliery 75W Modification Surface Water Assessment*.
- GSS Environmental (2013) *Angus Place Colliery Mining Operation Plan*.
- DTIRIS (2012) *EDG03 Guidelines to the Mining, Rehabilitation & Environmental Management Process*.
- RPS (2010) *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A*.
- RPS (2010a) *Flora and Fauna Assessment Proposed Longwalls 910 and 900W, Angus Place Colliery*.

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APPENDIX 1: Trigger Action Response

Plan for Land Management

Table 5. Trigger Action Response Plan for Land Management

| Aspect/Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|-----------------|--------------------------------------|------------------|---|--|--|
| Land | Subsidence | Trigger | Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) are less than the limits specified by the prediction model. | Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) are up to, but do not exceed the limits of the prediction model. | Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) exceed the limits of the prediction model. |
| | | Response | No response required. Continue monitoring program. | No response required. Continue monitoring program. | If subsidence within the Project Area exceeds the limits of the prediction model, notify the Director-General of DP&I, DTIRIS and relevant stakeholders of exceedance of subsidence predictions. Investigate exceedance of subsidence prediction model. Identify and implement remedial actions in consultation with relevant stakeholders, if necessary (e.g. undertake review of Land Management Plan). |
| | Clifflines and Rock Features | Trigger | Visual inspections of the site identify that there is no evidence of damage. | Visual inspections identify potential evidence of damage at the site i.e. minor cracking in rock face. | Visual inspections identify evidence of damage at the site i.e. cracking in rock face or rock fall. |
| | | Response | No response required. Continue monitoring program. | Review previous photographic evidence to identify if there have been visual changes to the site since the commencement of secondary extraction in Longwall 900W or 910 i.e. minor cracking. If visual changes are identified, undertake survey monitoring to identify if there is measurable subsidence beyond the design angle of draw or if impacts were the result of natural processes. If there is no measurable subsidence, or subsidence is <20mm, no response required as subsidence is negligible. Continue monitoring program. If measurable subsidence beyond the design angle of draw exceeds 20mm, undertake management as outlined for Condition Red responses. | Undertake survey monitoring to identify if there is measurable subsidence beyond the design angle of draw or if impacts were the result of natural processes. If subsidence beyond the design angle of draw exceeds 20mm, notify the Director-General of DP&I, DTIRIS and relevant stakeholders of exceedance of subsidence predictions. Erect warning signs and danger tape in immediate area. Investigate exceedance of subsidence prediction model. Identify and implement remedial actions in consultation with relevant stakeholders, if necessary. |
| | Surface Cracking on Roads and Tracks | Trigger | Surface cracking < 5 cm wide. | Surface Cracking 5-10 cm wide. | Surface cracking >10 cm wide. |
| | | Response | Continue monitoring program to confirm that cracks are adequately repaired naturally through sedimentation and infilling of vegetation and surface debris. | Prompt notification of FCNSW. In response to observed impact, erect warning signs or danger tape in the immediate area if considered a public danger. Repair by grading after subsidence is complete if required. Repairs to FCNSW roads/tracks to be completed in consultation with FCNSW. Monitor cracking. | Prompt notification of FCNSW. In response to observed impact, erect warning signs or danger tape in the immediate area if considered a public danger. Repair cracks >20 cm in width with excavation and re-compaction. A field inspection will be carried out by the Environmental Officer (for FCNSW roads/tracks). Angus Place will provide FCNSW with an invitation to attend relevant inspections. Repairs to FCNSW roads/tracks to be completed in consultation with FCNSW. |
| | Surface Cracking in Vegetated Areas | Trigger | Surface cracking < 10 cm wide. | Surface cracking 10-20 cm wide. | Surface cracking >20 cm wide |
| | | Response | No response required. Continue monitoring program. | Erect warning signs or danger tape if necessary and if a public hazard. Monitor cracks over next 12 months. | Erect warning signs or danger tape if necessary and if a public hazard. Repair cracks >20 cm in width where practicable. Assess public safety issues. |

| Aspect/ Category | Key Element | Trigger Response | Condition Green | Condition Amber | Condition Red |
|---------------------|---------------------------|---------------------|---|---|---|
| Land | Erosion and Sedimentation | Trigger | Visual inspections identify that there is no evidence of erosion. | Visual inspections identify evidence of minor erosion and sedimentation. | Visual inspections identify evidence of significant erosion and sedimentation. |
| | | Response | No response required. Continue monitoring program. | Field surface inspection by Environmental Officer to investigate cause. Implement management measures in consultation with FCNSW if deemed to be necessary. Continue monitoring program. | If erosion and sedimentation is threatening or causing material harm to the environment, immediately notify DP&I, DTIRIS, Environmental Protection Authority (EPA), Sydney Catchment Authority (SCA) (for catchments within their control) and FCNSW. Implement management measures in consultation with FCNSW as deemed appropriate. Continue Surface Water Monitoring Program with additional monitoring as required. |
| | Ponding | Trigger | No water ponding. | Temporary water ponding at the surface (<1 month) | Water ponding permanently at the surface. |
| | | Response | No response required. Continue monitoring program. | Immediately notify DP&I, DTIRIS, EPA, SCA (for catchments within their control) and FCNSW. Field surface inspection by Environmental Officer to investigate cause. Undertake geotechnical/hydrogeological investigation of the cause. Continue Surface Water Monitoring Program, with additional monitoring as required. | If ponding is threatening or causing material harm to the environment, immediately notify DP&I, DTIRIS, EPA, SCA (for catchments within their control) and FCNSW. Undertake geotechnical/hydrogeological investigation of the cause. Report to the Principal Subsidence Engineer (DTIRIS) on action to rectify. Implement Engineering Solutions as appropriate. Continue Surface Water Monitoring Program with additional monitoring as required. |

APPENDIX 2: MOP Rehabilitation Table

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--|---|---|--|-------------------|--------------------------|
| Phase – Decommissioning | | | | | | |
| Domain 1 – Infrastructure | | | | | | |
| All infrastructure removed | Services removed | Quarterly Rehabilitation Inspection report | Services removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Offices removed | Quarterly Rehabilitation Inspection report | Offices and foundations removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Workshops removed | Quarterly Rehabilitation Inspection report | Workshops, floors, footings etc. removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Fuel and chemical tanks and drums removed | Quarterly Rehabilitation Inspection report | Tanks, drums, compounds, footings and bunds removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Roads and tracks removed | Quarterly Rehabilitation Inspection report | Bitumen and gravel roads removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Water pumps and pipe lines removed | Quarterly Rehabilitation Inspection report | Pumps and pipelines removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| All hazardous materials and contaminated materials appropriately removed/remediated | Hazardous materials audits undertaken and contamination at acceptable levels | Contamination audit report(s) completed by specialist at mine closure | Hydrocarbons less than assessment criteria | NSW EPA (1994) NSW EPA (1998) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--|---|--|--|-------------------|--------------------------|
| | | Contamination audit report(s) completed by specialist at mine closure | Heavy metals less than assessment criteria | NSW EPA (1998) | No | Not commenced |
| Groundwater piezometers sealed | Groundwater piezometers and bores removed | Quarterly Rehabilitation Inspection report | Backfill and remove seal | Bore licence 10BL601829 Condition 11. | No | Not commenced |
| Management of European heritage site | Removal of concrete footings, foundations and associated cement structures | Quarterly Rehabilitation Inspection report | Removal of concrete footings, foundations and associated cement structures | Historic Heritage and Significance Assessment for the Vale of Clwydd No.2 Colliery (RPS, 2011) | No | Not commenced |
| | VOC#2 drift entry way and the building above it retained with its foundation stone inscription left intact | Quarterly Rehabilitation Inspection report | Drift entry, building and inscription retained | Historic Heritage and Significance Assessment for the Vale of Clwydd No.2 Colliery (RPS, 2011) | No | Not commenced |
| | Assessment of structural integrity by a structural engineer | Structural assessment completed by specialist | Assessment report received from structural engineer | Historic Heritage and Significance Assessment for the Vale of Clwydd No.2 Colliery (RPS, 2011) | No | Not commenced |
| Domain 2 – Subsidence Management Area | | | | | | |
| All underground mining infrastructure removed | Subsidence survey monitoring lines removed following completion of subsidence | Quarterly Rehabilitation Inspection report | Survey pegs removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|---|---|--|--|-------------------|--------------------------|
| | Fuel and chemical tanks and drums removed | Quarterly Rehabilitation Inspection report | Tanks, drums, compounds, footings and bunds removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| Groundwater piezometers sealed | Groundwater piezometers and bores removed | Quarterly Rehabilitation Inspection report | Backfill and remove | Bore licence 10BL601829 Condition 11. | No | Not commenced |
| Domain 3 - Water Management Area | | | | | | |
| All hazardous materials and contaminated materials appropriately removed/remediated | Hazardous materials audits undertaken and contamination at acceptable levels | Contamination audit report(s) completed by specialist at mine closure | Hydrocarbons less than assessment criteria | NSW EPA (1994) NSW EPA (1998) | No | Not commenced |
| | | Contamination audit report(s) completed by specialist at mine closure | Heavy metals less than assessment criteria | NSW EPA (1998) | No | Not commenced |
| Infrastructure removed | Dams and ancillary infrastructure removed apart from those required for post mining land use purposes | Quarterly Rehabilitation Inspection report | Dams removed apart from those required for post mining land use purposes | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| Domain A Rehabilitation – Woodland | | | | | | |
| All infrastructure removed | Services removed | Quarterly Rehabilitation Inspection report | Services removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Offices removed | Quarterly Rehabilitation Inspection report | Offices and foundations removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--|---|---|--|-------------------|--------------------------|
| | Workshops removed | Quarterly Rehabilitation Inspection report | Workshops, floors, footings etc. removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Fuel and chemical tanks and drums removed | Quarterly Rehabilitation Inspection report | Tanks, drums, compounds, footings and bunds removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Roads and tracks removed | Quarterly Rehabilitation Inspection report | Bitumen and gravel roads removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Water pumps and pipe lines removed | Quarterly Rehabilitation Inspection report | Pumps and pipelines removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| All hazardous materials and contaminated materials appropriately removed/remediated | Hazardous materials audits undertaken and contamination at acceptable levels | Contamination audit report(s) completed by specialist at mine closure | Hydrocarbons less than assessment criteria | NSW EPA (1994) NSW EPA (1998) | No | Not commenced |
| | | Contamination audit report(s) completed by specialist at mine closure | Heavy metals less than assessment criteria | NSW EPA (1998) | No | Not commenced |
| Groundwater piezometers sealed | Groundwater piezometers removed and sealed | Quarterly Rehabilitation Inspection report | Backfill and remove | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| Domain B Rehabilitation – Grassland | | | | | | |
| All infrastructure removed | Services removed | Quarterly Rehabilitation Inspection report | Services removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--|---|---|---|-------------------|--------------------------|
| | Offices removed | Quarterly Rehabilitation Inspection report | Offices and foundations removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSS, 2010a) | No | Not commenced |
| | Workshops removed | Quarterly Rehabilitation Inspection report | Workshops, floors, footings etc. removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSSE, 2010a) | No | Not commenced |
| | Fuel and chemical tanks and drums removed | Quarterly Rehabilitation Inspection report | Tanks, drums, compounds, footings and bunds removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSSE, 2010a) | No | Not commenced |
| | Mine owned roads and tracks removed | Quarterly Rehabilitation Inspection report | Bitumen and gravel roads removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSSE, 2010a) | No | Not commenced |
| | Water pumps and pipe lines removed | Quarterly Rehabilitation Inspection report | Pumps and pipelines removed | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSSE, 2010a) | No | Not commenced |
| All hazardous materials and contaminated materials appropriately removed/remediated | Hazardous materials audits undertaken and contamination at acceptable levels | Contamination audit report(s) completed by specialist at mine closure | Hydrocarbons less than assessment criteria | NSW EPA (1994) NSW EPA (1998) | No | Not commenced |
| | | Contamination audit report(s) completed by specialist at mine closure | Heavy metals less than assessment criteria | NSW EPA (1998) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|---|--|---|---|-------------------|--------------------------|
| Domain C - Water Management Area | | | | | | |
| All hazardous materials and contaminated materials appropriately removed/remediated | Hazardous materials audits undertaken and contamination at acceptable levels | Contamination audit report(s) completed by specialist at mine closure | Hydrocarbons less than assessment criteria | NSW EPA (1994) NSW EPA (1998) | No | Not commenced |
| | | Contamination audit report(s) completed by specialist at mine closure | Heavy metals less than assessment criteria | NSW EPA (1998) | No | Not commenced |
| Infrastructure removed | Dams and ancillary infrastructure removed apart from those required for post mining land use purposes | Quarterly Rehabilitation Inspection report | Dams and ancillary infrastructure removed apart from those required for post mining land use purposes | Mod 1 Rehabilitation Strategy Section 3.3.2.(GSSE, 2010a) | No | Not commenced |
| Phase – Landform Establishment | | | | | | |
| Domain 1 – Infrastructure | | | | | | |
| | Slope Gradient | Annual geotechnical stability inspection | No less than 75% of rehabilitation area has slopes <10° | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Erosion control structures are installed at intervals commensurate with the slope of the landform | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--------------------|--|---|--|-------------------|--------------------------|
| Landform generally blends in with surrounding landscape and is stable | | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Dimensions and frequency of occurrence of erosion rills and gullies are generally no greater than that in reference sites that exhibit similar landform characteristics | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Landform generally blends in with surrounding landscape and is stable | Drainage condition | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Drainage condition | Annual geotechnical stability inspection | All landforms free draining except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Water quality non-polluting and appropriate for end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|------------------------|--|---|--|-------------------|--------------------------|
| Domain 2 - Subsidence Management Area | | | | | | |
| Landform generally blends in with surrounding landscape and is stable | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Erosion control structures are installed at intervals commensurate with the slope of the landform | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Landform generally blends in with surrounding landscape and is stable | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Dimensions and frequency of occurrence of erosion rills and gullies are generally no greater than that in reference sites that exhibit similar landform characteristics | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Drainage condition | Annual geotechnical stability inspection | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Water quality non-polluting and appropriate for end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain 3 - Water Management Area | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--------------------|--|---|--|-------------------|--------------------------|
| Landform generally blends in with surrounding landscape and is stable | Drainage condition | Annual geotechnical stability inspection | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Landform generally blends in with surrounding landscape and is stable | Drainage condition | Annual geotechnical stability inspection | All landforms free draining except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Water quality non-polluting and appropriate for end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain A Rehabilitation – Woodland | | | | | | |
| | Slope Gradient | Annual geotechnical stability inspection | No less than 75% of the rehabilitation area has slopes <10° | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|------------------------|---|---|---|-------------------|--------------------------|
| Landform generally blends in with surrounding landscape and is stable | | Annual geotechnical stability inspection | Where reject layers are present and exposed, the landform is capped with a minimum of 1.5 metres of inert material and be free draining | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Erosion control structures are installed at intervals commensurate with the slope of the landform | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | | Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced | |
| Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | | Dimensions and frequency of occurrence of erosion rills and gullies are generally no greater than that in reference sites that exhibit similar landform characteristics | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced | |
| Landform generally blends in with surrounding landscape and is stable | Drainage condition | Annual geotechnical stability inspection | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|----------------|--|---|--|-------------------|--------------------------|
| | | Annual geotechnical stability inspection | All landforms free draining except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Water quality non-polluting and appropriate for end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain B Rehabilitation – Grassland | | | | | | |
| Landform generally blends in with surrounding landscape and is stable | Slope Gradient | Annual geotechnical stability inspection | No less than 75% of the rehabilitation area has slopes <10° | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Annual geotechnical stability inspection | Where reject layers are present and exposed, the landform is capped with a minimum of 1.5 metres of inert material and be free draining | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Erosion control structures are installed at intervals commensurate with the slope of the landform | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|------------------------|--|---|---|-------------------|--------------------------|
| Landform generally blends in with surrounding landscape and is stable | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Average soil loss per annum is <40 tonnes/ha/yr (sheet erosion) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Minimal active erosion | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Dimensions and frequency of occurrence of erosion rills and gullies are generally no greater than that in reference sites that exhibit similar landform characteristics | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Drainage condition | Results from erosion monitoring (50m transect) undertaken 1 year after establishment then every 2 years. | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Annual geotechnical stability inspection | All landforms free draining except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--------------------|--|---|--|-------------------|--------------------------|
| Water quality non-polluting and appropriate for end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain C – Water Management Area | | | | | | |
| Landform generally blends in with surrounding landscape and is stable | Drainage condition | Annual geotechnical stability inspection | Construction of contour banks and diversion drains to direct water into stable areas or sediment control basins | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Annual geotechnical stability inspection | All landforms free draining except where specific structures have been constructed for the storage of water as required for sediment and erosion control or post mining landuse | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Water quality non-polluting and appropriate for forestry end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Phase - Growth Medium Development | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---------------------------|---|---|---|---|-------------------|--------------------------|
| Domain 1 – Infrastructure | | | | | | |
| Class VIII – Timber | Soil in shaped areas to be ameliorated to sustain forestry ecosystems | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | ESP <15% | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | pH >5.5 and <8.5 | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | EC <0.6ds/m | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months Photographic records | Nutrient accumulation and recycling processes are occurring as evidenced by the presence of a litter layer, mycorrhizae and/or other microsymbionts | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|---|---|---|-------------------|--------------------------|
| Class VIII - Timber | Soil in shaped areas to be ameliorated to sustain forestry ecosystems | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Adequate macro and micronutrients are present | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Class IV – Grazing, occasional cultivation | Develop a stable landform suitable for grazing | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | ESP <15% | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | pH >5.5 and <8.5 | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | EC <0.6ds/m | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months Photographic records | Nutrient accumulation and recycling processes are occurring as evidenced by the presence of a litter layer, mycorrhizae and/or other microsymbionts | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|--|---|---|---|-------------------|--------------------------|
| Class IV – Grazing, occasional cultivation | Develop a stable landform suitable for grazing | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Adequate macro and micronutrients are present | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 2 - Subsidence Management Area | | | | | | |
| Class VIII – Timber | Soils ameliorated to sustain native ecosystems as required | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | ESP <15% | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | pH >5.5 and <8.5 | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | EC <0.6ds/m | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|--|---|---|--|-------------------|--------------------------|
| Class VIII – Timber | Soils ameliorated to sustain native ecosystems as required | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months Photographic records | Nutrient accumulation and recycling processes are occurring as evidenced by the presence of a litter layer, mycorrhizae and/or other microsymbionts | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Adequate macro and micronutrients are present | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 3 - Water Management Area | | | | | | |
| Water quality non-polluting and appropriate for forestry end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain A Rehabilitation – Woodland | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|---|---|---|---|-------------------|--------------------------|
| Land capability VIII and capable of sustaining native ecosystem | Soils ameliorated to sustain native woodland ecosystems as required | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | ESP <15% | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | pH >5.5 and <8.5 | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | EC <0.6ds/m | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months Photographic records | Nutrient accumulation and recycling processes are occurring as evidenced by the presence of a litter layer, mycorrhizae and/or other microsymbionts | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Land capability VIII and capable of sustaining native ecosystem | Soils ameliorated to sustain native woodland ecosystems as required | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Adequate macro and micronutrients are present | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|---|---|--|---|-------------------|--------------------------|
| Domain B Rehabilitation – Grassland | | | | | | |
| Land capability IV and capable of sustaining grasslands | Soils ameliorated to sustain grasslands | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | ESP <15% | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | pH >5.5 and <8.5 | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | EC <0.6ds/m | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Nutrient accumulation and recycling processes are deemed to be occurring | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Land capability IV and capable of sustaining grasslands | Soils ameliorated to sustain grasslands | Analyses of soil samples from 20 m x 10 m plot sampling undertaken quarterly for the first 12 months then every 12 months | Adequate macro and micronutrients are present | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain C – Water Management Area | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|--|-------------------|--------------------------|
| Water quality non-polluting and appropriate for forestry end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Phase - Ecosystem Establishment | | | | | | |
| Domain 1 – Infrastructure | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area accomplishes and remains as a healthy woodland/grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland/grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|---|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. Photographic records | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species in woodland areas (not applicable to grassland areas) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Vegetation in woodland areas develops and maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons (not applicable to grassland areas) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Ecosystems established | Vegetation association – | Photographic records | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|--|---|-------------------|--------------------------|
| consistent with analogue vegetation communities | community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of shrubs and/or trees in woodland areas are healthy when ranked healthy, sick or dead (not applicable to grassland areas) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 2 - Subsidence Management Area | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area accomplishes and remains as a healthy native woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|---|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. Photographic records | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Vegetation develops and maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Ecosystems established consistent with analogue | Vegetation association – community and structure development consistent | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|---|---------------------------|--|--|--|-------------------|--------------------------|
| vegetation communities | with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of shrubs and/or trees are healthy when ranked healthy, sick or dead | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 3 - Water Management Area | | | | | | |
| Water quality non-polluting and appropriate for forestry end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain A Rehabilitation – Woodland | | | | | | |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area accomplishes and remains as a healthy native woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. Photographic records | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Vegetation develops and maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of shrubs and/or trees are healthy when ranked healthy, sick or dead | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain B Rehabilitation – Grassland | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area accomplishes and remains as a healthy native grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of grasses representative of regionally occurring species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development vegetation growth | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|--|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain C – Water Management Area | | | | | | |
| Water quality non-polluting and appropriate for forestry end land use | Water quality | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Phase - Ecosystem Development | | | | | | |
| Domain 1 – Infrastructure | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. | Area remains as a healthy native woodland/grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland/grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Ecosystems established consistent with analogue | Vegetation association – community and structure | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--------------------------|--|--|---|---|-------------------|--------------------------|
| vegetation communities | development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species in woodland areas (not applicable to grassland) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Woodland vegetation maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons (not applicable to grassland) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Ecosystems established | Vegetation association – community and structure | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| consistent with analogue vegetation communities | development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of woodland shrubs and/or trees are healthy when ranked healthy, sick or dead (not applicable to grassland) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 2 - Subsidence Management Area | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area remains as a healthy native woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|--|---|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|--|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | communities | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Vegetation maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of shrubs and/or trees are healthy when ranked healthy, sick or dead | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain 3 - Water Management Area | | | | | | |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|--|-------------------|--------------------------|
| Ecosystem health | Remaining water management structures are safe, stable and non-polluting | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |
| Domain A Rehabilitation – Woodland | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area remains as a healthy native woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of native trees, shrubs and grasses representative of regionally occurring woodland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|--|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of native plant species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Photographic records | Evidence of second generation of shrub and understorey species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Vegetation maintains a litter layer evidenced by a consistent mass and depth of litter over subsequent seasons | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | More than 75% of shrubs and/or trees are healthy when ranked healthy, sick or dead | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain B Rehabilitation – Grassland | | | | | | |
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Area remains as a healthy native grassland | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Minimum of 70% vegetative cover is present (or 50% if rocks, logs or other features of cover are present) | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|---|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | No bare surfaces >20 m ² in area or >10 metres in length down slope | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Species composition to comprise a mixture of grasses representative of regionally occurring species | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Results from 20 m x 10 m plot sampling, and 2 m x 2 m quadrat sampling, undertaken on rehabilitation areas quarterly for the first 12 months then every 12 months. Photographic records | Established species survive and/or regenerate after disturbance | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Quarterly rehabilitation inspections during the first two years then biennially. Opportunistic inspections after significant rainfall events. | Weeds do not dominate native species after disturbance or after rain | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |

| Rehabilitation Objective | Indicator | Performance Measure | Completion Criteria | Justification/Source | Complete (Yes/No) | Progress at start of MOP |
|--|---|--|---|--|-------------------|--------------------------|
| Ecosystems established consistent with analogue vegetation communities | Vegetation association – community and structure development consistent with analogue communities | Quarterly rehabilitation inspections during the first two years then biennially. | Pests do not occur in substantial numbers or visibly affect the development of vegetation | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| | | Photographic records | Species are capable of setting viable seed, flowering or otherwise reproducing | Mod 1 Rehabilitation Strategy Section 5.(GSSE, 2010a) | No | Not commenced |
| Domain C – Water Management Area | | | | | | |
| Ecosystem health | Remaining water management structures are safe, stable and non-polluting | Quarterly water quality monitoring (or following rainfall) in accordance with the Site Water Management Plan | Complies with water quality criteria established in the Site Water Management Plan | Angus Place Site Water Management Plan, Section 8.2 (2012) | No | Not commenced |

APPENDIX 3: Flora Species List

| Family | Scientific Name | Common Name |
|-------------------|---|--------------------------|
| TREES | | |
| Casuarinaceae | <i>Allocasuarina nana</i> | Dwarf She-oak |
| Cupressaceae | <i>Callitris rhomboidea</i> | Port Jackson Cypress |
| Myrtaceae | <i>Eucalyptus blaxlandii</i> | Blaxland's Stringybark |
| Myrtaceae | <i>Eucalyptus dalrympleana</i> | Mountain Gum |
| Myrtaceae | <i>Eucalyptus dives</i> | Broad-leaved Peppermint |
| Myrtaceae | <i>Eucalyptus fastigata</i> | Brown Barrel |
| Myrtaceae | <i>Eucalyptus oreades</i> | Blue Mountains Ash |
| Myrtaceae | <i>Eucalyptus pauciflora</i> | Snow Gum |
| Myrtaceae | <i>Eucalyptus radiata</i> | Narrow-leaved Peppermint |
| Myrtaceae | <i>Eucalyptus sclerophylla</i> | Scribbly Gum |
| Myrtaceae | <i>Eucalyptus sieberi</i> | Silvertop Ash |
| SHRUBS | | |
| Apiaceae | <i>Platysace linearifolia</i> | Narrow-leaved Platysace |
| Araliaceae | <i>Polyscias sambucifolia</i> | Elderberry Panax |
| Asteraceae | <i>Cassinia arcuata</i> | Sifton Bush |
| Asteraceae | <i>Cassinia cunninghamii</i> | Cunningham's Everlasting |
| Asteraceae | <i>Olearia erubescens</i> | Silky Daisy Bush |
| Casuarinaceae | <i>Allocasuarina distyla</i> | - |
| Epacridaceae | <i>Brachyloma daphnoides</i> | Daphne Heath |
| Epacridaceae | <i>Epacris microphylla</i> | Coral Heath |
| Epacridaceae | <i>Epacris pulchella</i> | Wallum Heath |
| Epacridaceae | <i>Leucopogon lanceolatus</i> | Lance-leaf Beard-heath |
| Epacridaceae | <i>Monotoca elliptica</i> | Tree Broom-heath |
| Epacridaceae | <i>Monotoca scoparia</i> | Prickly Broom-heath |
| Euphorbiaceae | <i>Amperea xiphoclada</i> var. <i>xiphoclada</i> | Broom Spurge |
| Fabaceae/faboide: | <i>Daviesia latifolia</i> | - |
| Fabaceae/faboide: | <i>Daviesia squarrosa</i> | - |
| Fabaceae/faboide: | <i>Gompholobium huegelii</i> | Pale Wedge Pea |
| Fabaceae/faboide: | <i>Mirbelia platylobioides</i> | - |
| Fabaceae/faboide: | <i>Phyllota squarrosa</i> | Dense Phyllota |
| Fabaceae/faboide: | <i>Acacia buxifolia</i> | Box-leaf Wattle |
| Fabaceae/faboide: | <i>Acacia rubida</i> | Red-stemmed Wattle |
| Fabaceae/faboide: | <i>Acacia terminalis</i> | Sunshine Wattle |
| Myrtaceae | <i>Baeckea linifolia</i> | Weeping Baeckea |
| Myrtaceae | <i>Leptospermum arachnoides</i> | - |
| Myrtaceae | <i>Leptospermum continentale</i> | Tea-tree |
| Myrtaceae | <i>Leptospermum grandifolium</i> | Woolly Tea-tree |
| Myrtaceae | <i>Leptospermum obovatum</i> | - |
| Myrtaceae | <i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> | Tantoon |
| Myrtaceae | <i>Leptospermum trinervium</i> | Slender Tea-tree |
| Proteaceae | <i>Banksia cunninghamii</i> subsp. <i>cunninghamii</i> | - |
| Proteaceae | <i>Banksia ericifolia</i> var. <i>ericifolia</i> | Heath-leaved Banksia |
| Proteaceae | <i>Grevillea acanthifolia</i> subsp. <i>acanthifolia</i> | - |
| Proteaceae | <i>Grevillea laurifolia</i> | Laurel-leaf Grevillea |
| Proteaceae | <i>Hakea dactyloides</i> | Broad-leaved Hakea |
| Proteaceae | <i>Hakea sericea</i> | Needlebush |
| Proteaceae | <i>Isopogon anemonifolius</i> | Flat-leaved Drumsticks |
| Proteaceae | <i>Lomatia myricoides</i> | River Lomatia |
| Proteaceae | <i>Lomatia silaifolia</i> | Crinkle Bush |
| Proteaceae | <i>Persoonia chamaepitys</i> | Mountain Geebung |

| | | |
|------------------------|--|----------------------|
| Proteaceae | <i>Persoonia hindii</i> | - |
| Proteaceae | <i>Persoonia myrtilloides</i> subsp. <i>myrtilloides</i> | - |
| Proteaceae | <i>Persoonia oblongata</i> | - |
| Proteaceae | <i>Persoonia recedens</i> | - |
| Proteaceae | <i>Petrophile pulchella</i> | Conesticks |
| Proteaceae | <i>Petrophile sessilis</i> | Conesticks |
| Rhamnaceae | <i>Pomaderris andromedifolia</i> | - |
| Rutaceae | <i>Boronia microphylla</i> | Small-leaved Boronia |
| Santalaceae | <i>Leptomeria acida</i> | Native Currant |
| Santalaceae | <i>Omphacomeria acerba</i> | - |
| Scrophularaceae | <i>Derwentia blakelyi</i> | - |

GROUNDCOVERS

| | | |
|------------------|--|-----------------------------|
| Asteraceae | <i>Arrhenechthites mixta</i> | Purple Fireweed |
| Asteraceae | <i>Helichrysum rutidolepis</i> | Pale Everlasting |
| Asteraceae | <i>Hypochaeris glabra</i> * | Smooth Catsear |
| Asteraceae | <i>Hypochaeris radicata</i> * | Flatweed |
| Asteraceae | <i>Lagenophora stipitata</i> | - |
| Asteraceae | <i>Senecio linearifolius</i> | Fireweed |
| Clusiaceae | <i>Hypericum gramineum</i> | Small St Johns Wort |
| Cyperaceae | <i>Gahnia aspera</i> | Saw Sedge |
| Cyperaceae | <i>Gahnia microstachya</i> | - |
| Cyperaceae | <i>Gahnia sieberiana</i> | Red-fruited Saw-sedge |
| Cyperaceae | <i>Lepidosperma laterale</i> | Variable Sword-sedge |
| Cyperaceae | <i>Lepidosperma limicola</i> | - |
| Dennstaedtiaceae | <i>Pteridium esculentum</i> | Bracken |
| Dilleniaceae | <i>Hibbertia (monogyne ?)</i> | - |
| Dilleniaceae | <i>Hibbertia obtusifolia</i> | Grey Guinea Flower |
| Droseraceae | <i>Drosera peltata</i> | Sundew |
| Droseraceae | <i>Drosera spathulata</i> | Common Sundew |
| Euphorbiaceae | <i>Poranthera microphylla</i> | - |
| Gentianaceae | <i>Centaurium erythraea</i> * | Common Centaury |
| Gleicheniaceae | <i>Gleichenia dicarpa</i> | Pouched Coral Fern |
| Goodeniaceae | <i>Dampiera stricta</i> | Blue Dampiera |
| Goodeniaceae | <i>Goodenia bellidifolia</i> | Daisy-leaved Goodenia |
| Goodeniaceae | <i>Goodenia hederacea</i> subsp. <i>hederacea</i> | Ivy-leaved Goodenia |
| Haloragaceae | <i>Gonocarpus tetragynus</i> | Poverty Raspwort |
| Haloragaceae | <i>Gonocarpus teuroides</i> | Raspwort |
| Iridaceae | <i>Patersonia glabrata</i> | Leafy Purple-flag |
| Iridaceae | <i>Patersonia sericea</i> | Wild Iris |
| Lomandraceae | <i>Lomandra filiformis</i> subsp. <i>coriacea</i> | Wattle Mat-rush |
| Lomandraceae | <i>Lomandra filiformis</i> subsp. <i>filiformis</i> | Wattle Mat-rush |
| Lomandraceae | <i>Lomandra glauca</i> | Pale Mat-rush |
| Lomandraceae | <i>Lomandra longifolia</i> | Spiky-headed Mat-rush |
| Lomandraceae | <i>Lomandra multiflora</i> | Many-flowered Mat-rush |
| Orchidaceae | <i>Dipodium punctatum</i> | Hyacinth Orchid |
| Oxalidaceae | <i>Oxalis perrenans</i> | Yellow-flowered Wood Sorrel |
| Phormiaceae | <i>Dianella caerulea</i> var. <i>producta</i> | Blue Fla1 Lily |
| Phormiaceae | <i>Dianella revoluta</i> var. <i>revoluta</i> | Spreading Fla1 Lily |
| Poaceae | <i>Austrodanthonia racemosa</i> var. <i>racemosa</i> | Wallaby Grass |
| Poaceae | <i>Austrostipa pubescens</i> | Tall Speargrass |
| Poaceae | <i>Joycea pallida</i> | Silvertop Wallaby Grass |
| Poaceae | <i>Microlaena stipoides</i> var. <i>stipoides</i> | Weeping Rice Grass |

| | | |
|------------------|--|-----------------------------|
| Poaceae | <i>Poa seiberiana</i> var. <i>cyanophylla</i> | - |
| Restionaceae | <i>Baloskion australe</i> | - |
| Restionaceae | <i>Empodisma minus</i> | - |
| Stylidiaceae | <i>Stylidium graminifolium</i> | Grass Trigger Plant |
| Stylidiaceae | <i>Stylidium lineare</i> | Narrow-leaved Trigger Plant |
| Thymelaeaceae | <i>Pimelea linifolia</i> subsp. <i>linifolia</i> | Slender Rice Flower |
| Tremandraceae | <i>Tetralochea rupicola</i> | Black-eyed Susan |
| Violaceae | <i>Hybanthus monopetalus</i> | Slender Violet |
| Violaceae | <i>Hybanthus vernonii</i> subsp. <i>vernonii</i> | - |
| Violaceae | <i>Viola betonicifolia</i> | Native Violet |
| Violaceae | <i>Viola hederacea</i> | Ivy-leaved Violet |
| Xanthorrhoeaceae | <i>Xanthorrhoea resinosa</i> | - |

CLIMBERS

| | | |
|----------------|-----------------------------|------------------|
| Pittosporaceae | <i>Billardiera scandens</i> | Hairy Appleberry |
|----------------|-----------------------------|------------------|

APPENDIX 4: Stakeholder Consultation



Centennial Coal

Angus Place



15 November 2013

Dr Ravi Sundaram
Manager Mining and Utilities
Sydney Catchment Authority
PO Box 323
Penrith NSW 2751

Dear Ravi,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

The enclosed Longwalls 900W and 910 Rehabilitation Management Plan outlines the measures that will be implemented to rehabilitate potential subsidence related impacts to land resulting from the secondary extraction of Longwalls 900W and 910. This Longwalls 900W and 910 Rehabilitation Management Plan is consistent with the contents of the approved Angus Place Mining Operations Plan and the approved Ventilation Facility Rehabilitation Management Plan, which were prepared in consultation with relevant NSW government departments.

Accordingly this document has been provided to the Sydney Catchment Authority for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

If you require any further information regarding the enclosed management plan please contact the Angus Place Environment and Community Coordinator, Natalie Conroy by telephone, on (02) 6354 8938 or by email, Natalie.conroy@centennialcoal.com.au.

Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



Centennial Coal

Angus Place



15 November 2013

Mr Peter Christie
Head, Biodiversity Conservation Unit
Office of Environment and Heritage
PO Box 2111
Dubbo NSW 2830

Dear Peter,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the Office of Environment and Heritage for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

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Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



Centennial Coal

Angus Place



15 November 2013

Mr Marc Irvin
Senior Threatened Species Officer
Biodiversity Conservation Unit
Office of Environment and Heritage
PO Box 2111
Dubbo NSW 2830

Dear Marc,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the Office of Environment and Heritage for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

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Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



Centennial Coal

Angus Place



15 November 2013

Mr Mark Mignanelli
Senior Licensing Officer
NSW Office of Water
PO Box 3720
Parramatta NSW 2124

Dear Mark,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the NSW Office of Water for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

If you require any further information regarding the enclosed management plan please contact the Angus Place Environment and Community Coordinator, Natalie Conroy by telephone, on (02) 6354 8938 or by email, Natalie.conroy@centennialcoal.com.au.

Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



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Angus Place



15 November 2013

Mr Jason Molkentin
Regional Manager – Macquarie Region
Forestry Corporation of NSW
PO Box 143
Bathurst NSW 2795

Attention: Ms Melanie Klootwijk

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the Forestry Corporation of NSW for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

If you require any further information regarding the enclosed management plan please contact the Angus Place Environment and Community Coordinator, Natalie Conroy by telephone, on (02) 6354 8938 or by email, Natalie.conroy@centennialcoal.com.au.

Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



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15 November 2013

Mr Greg Kininmonth
Team Leader Environment
NSW Department of Trade and Investment, Regional Infrastructure and Services
Division of Resources and Energy
PO Box 674
Wollongong East NSW 2520

Dear Greg,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

If you require any further information regarding the enclosed management plan please contact the Angus Place Environment and Community Coordinator, Natalie Conroy by telephone, on (02) 6354 8938 or by email, Natalie.conroy@centennialcoal.com.au.

Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



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Angus Place



15 November 2013

Lauren Stevens
Team Leader – Development Planning
Lithgow City Council
PO Box 19
Lithgow NSW 2790

Dear Lauren,

Re: Angus Place Colliery Rehabilitation Management Plan

Angus Place has been preparing an Integrated Subsidence Management Plan (SMP)/Extraction Plan for Longwalls 900W and 910 in accordance with regulatory requirements outlined within the Project Approval and Mining Lease conditions. An overview of the above mentioned regulatory requirements are included within the plan.

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Accordingly this document has been provided to the Lithgow City Council for review as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan. If there are any objections to its contents please notify Angus Place by 25 November 2013. By default if no comment or extension request is received by Angus Place by this date it will be assumed that there are no objections and the document will be submitted for approval as a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan.

If you require any further information regarding the enclosed management plan please contact the Angus Place Environment and Community Coordinator, Natalie Conroy by telephone, on (02) 6354 8938 or by email, Natalie.conroy@centennialcoal.com.au.

Yours sincerely


Brian Nicholls
Manager of Mining Engineering
Centennial Angus Place



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PO Box 42

Wallerawang NSW 2845

