



Centennial Coal

Angus Place



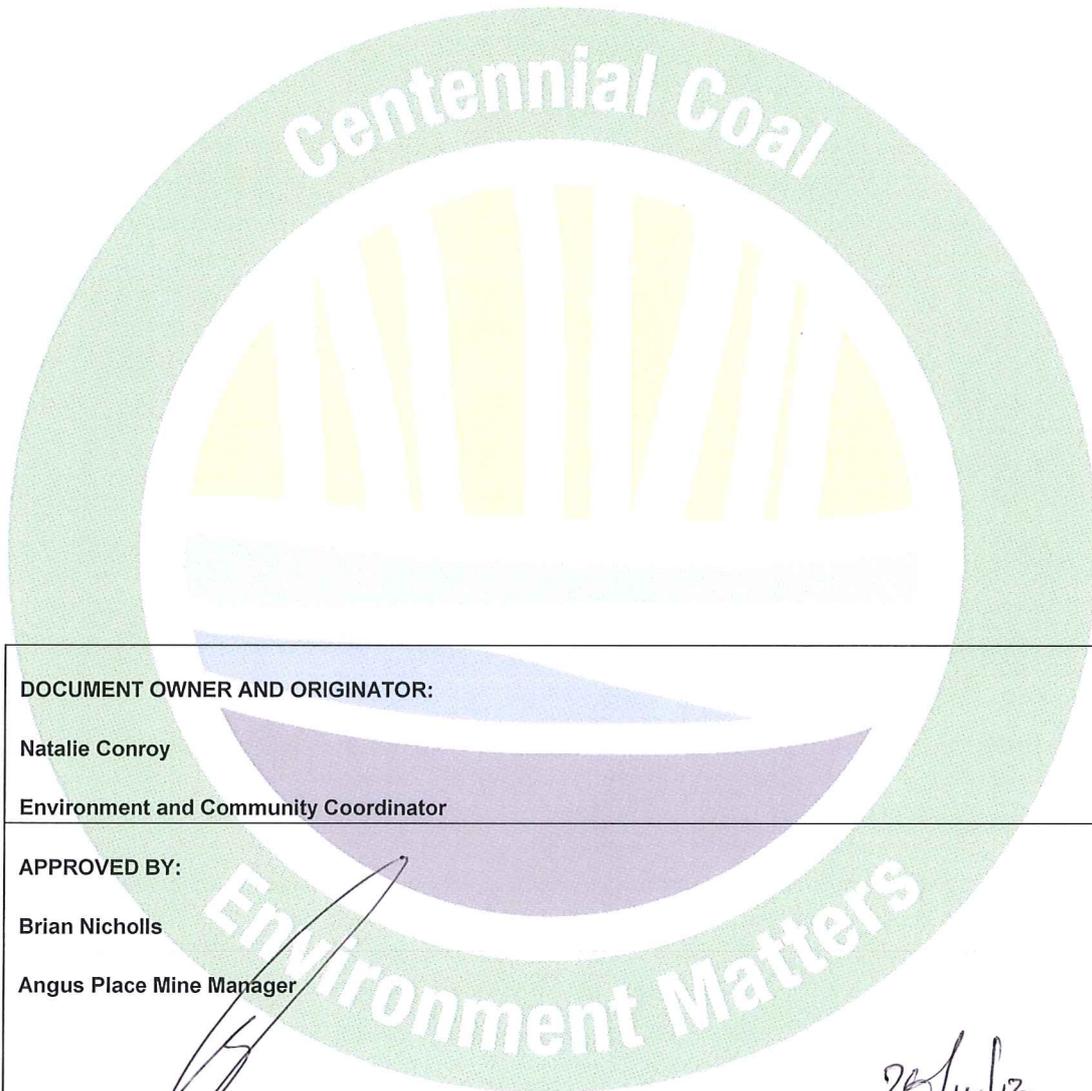
Longwalls 900W and 910 Built Features Management Plan

Angus Place Colliery

November 2013



This page has been intentionally left blank.



<p>DOCUMENT OWNER AND ORIGINATOR: Natalie Conroy Environment and Community Coordinator</p>			
<p>APPROVED BY: Brian Nicholls Angus Place Mine Manager</p> <p>Signature: <i>[Handwritten Signature]</i> Date: <i>26/11/13</i></p>			
<p>DISTRIBUTION: Lotus Notes (Angus Place), Endeavour Energy, Forestry Corporation of NSW, Department of Finance and Services – Land and Property Information, Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy, SMP Interagency Committee.</p>			
Title	Date Effective:	Revision Status:	Planned Review:
Longwalls 900W and 910 Built Features Management Plan	26/11/2013	1.2	As per Section 15

This page has been intentionally left blank.

TABLE OF CONTENTS

1. INTRODUCTION	1
2. PURPOSE	1
3. SCOPE	1
4. REGULATORY REQUIREMENTS	4
4.1. Project Approval and Statement of Commitments.....	4
4.2. Mining Leases.....	5
4.3. Longwalls 930 – 980 SMP Approval.....	5
5. RELEVANT FEATURE(S) AND PREDICTED IMPACTS	6
5.1. Relevant Feature(s).....	6
5.1.1. <i>Forest Access Tracks</i>	6
5.1.2. <i>State Survey Marks</i>	6
5.1.3. <i>Endeavour Energy 66kV Powerline</i>	7
5.2. Predicted Impacts.....	7
5.2.1. <i>Forest Access Tracks</i>	7
5.2.2. <i>State Survey Marks</i>	7
5.2.3. <i>Endeavour Energy 66kV Powerline</i>	7
5.2.4. <i>Subsidence Assessment Review</i>	8
6. IDENTIFIED RISKS	9
7. PERFORMANCE MEASURES AND INDICATORS	11
7.1. Performance Measures.....	11
7.2. Performance Indicators.....	11
8. MANAGEMENT MEASURES	11
8.1. Forest Access Tracks.....	11
8.2. State Survey Marks.....	12
8.3. Endeavour Energy 66kV Powerline.....	13
9. MONITORING PROGRAM	13
9.1. Baseline Monitoring.....	13
9.2. Monitoring Subsidence Impacts.....	14
9.3. Monitoring Environmental Consequences.....	15
9.4. Success of Remediation Measures.....	15
10. CONSULTATION	15
11. ADAPTIVE MANAGEMENT	16
12. CONTINGENCY PLAN	16
13. ROLES AND RESPONSIBILITIES	19
14. REPORTING	20
15. REVIEW	20
16. REFERENCES	21

Tables

Table 1.	Relevant Project Approval Conditions	4
Table 2.	Relevant Mining Lease Conditions.....	5
Table 3.	Relevant SMP Approval Conditions	6
Table 4.	Predicted Cumulative Subsidence Impact Parameters for Forest Access Tracks	7
Table 5.	Risk to Built Features	9
Table 6.	State Survey Marks within Project Area	12
Table 7.	Subsidence Monitoring Program.....	14
Table 8.	Trigger Action Response Plan for Built Features.....	17
Table 9.	Key Personnel and Accountabilities	19

Figures

Figure 1	Locality.....	2
Figure 2	Built Features	3

Plates

Plate 1.	Warning Sign at Angus Place	12
----------	-----------------------------------	----

Appendices

Appendix 1	Longwall 900W Powerline Management Plan
Appendix 2	Stakeholder Consultation

Abbreviations

AEMR	Annual Environmental Management Report (now known as Annual Review)
CCL	Consolidated Coal Lease
DgS	Ditton Geotechnical Services
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
FCNSW	Forestry Corporation of NSW
ML	Mining Lease
MOP	Mining Operations Plan
Mtpa	Million Tonnes per Annum
PA	Project Approval
ROM	Run of mine
SCIMS	Survey Control Information Management System
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 NSW 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 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 Built Features Management Plan* (Built Features Management Plan) has been developed in accordance with Schedule 3, Condition 3C(g) 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**.

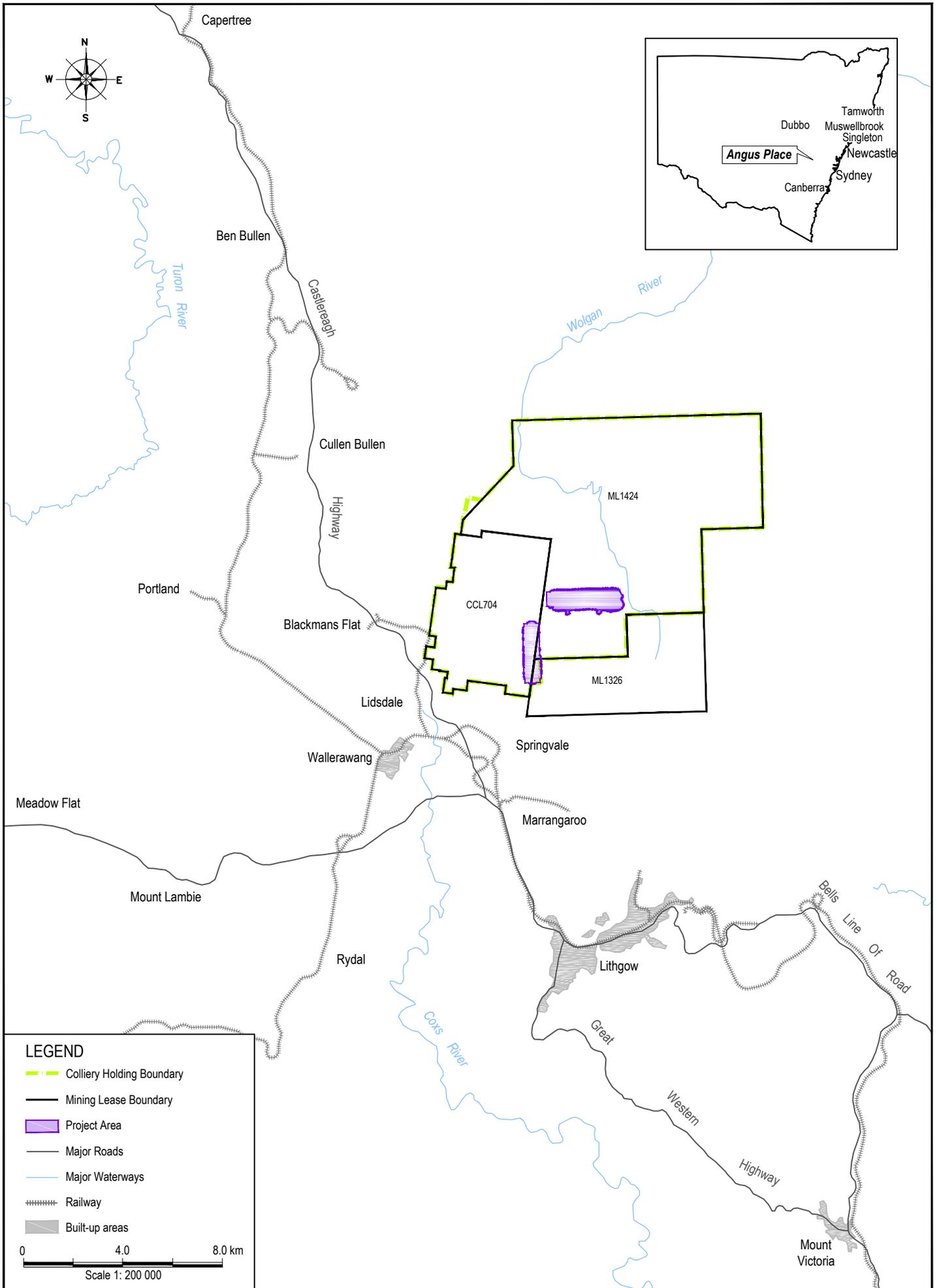
2. PURPOSE

The purpose of this Built Features Management Plan is to outline the monitoring and management measures that will be implemented to minimise the risk of potential subsidence related impact to infrastructure located above Longwalls 900W and 910 including forest access tracks, state survey marks and an Endeavour Energy (formerly Integral Energy) owned 66kV powerline. Required actions and responsibilities are defined to ensure detection of any potential damage from mining induced subsidence.

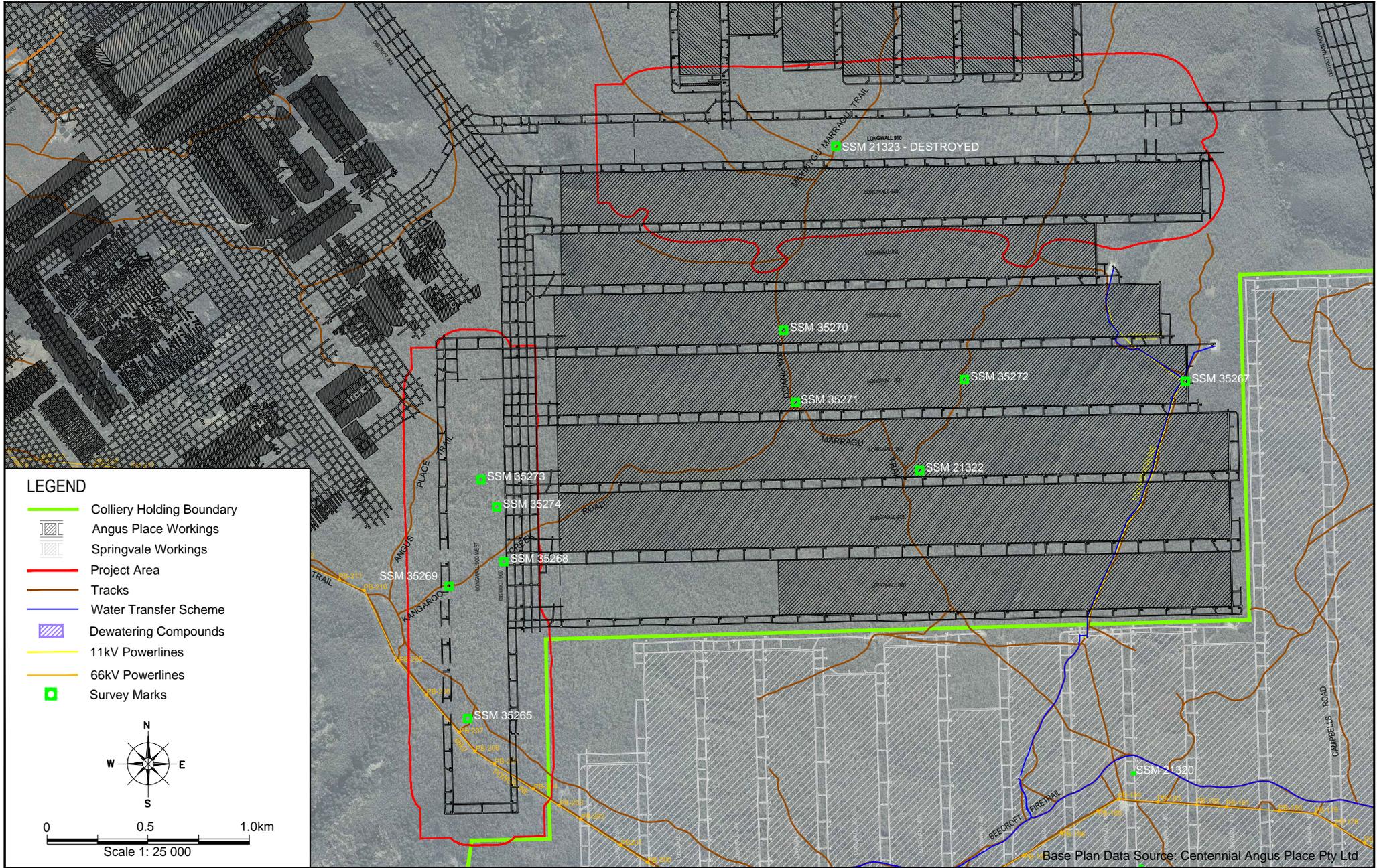
3. SCOPE

This Built Features Management Plan applies to the forest access tracks (including Kangaroos Creek Road, Beecroft Fire Trail and Mayinygu Marragu Trail), state survey marks and the Endeavour Energy owned 66kV powerline located within the Longwalls 900W and 910 area (herein referred to as 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.



To be printed A4



To be printed A4

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 Built Features 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 8.1 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) outlines one commitment relevant to the management of infrastructure associated with the Project Area. The commitment specified that the existing Infrastructure Management Plan would be reviewed “to include design measures recommended in the subsidence report (DgS, 2010) for the proposed pipeline and powerline” (RPS, 2010). This commitment relates to the proposed installation of a dewatering bore, pipeline, powerline and access track above the eastern end of Longwall 910. In the document entitled *Environmental Assessment Response to Submissions* (Angus Place, 2011), Angus Place outlined that “no construction is now proposed beyond the existing footprint approved under the existing 2006 Project Approval 06_0021”. Accordingly the inclusion of the proposed pipeline and powerline or associated design measures are no longer relevant to the preparation of this Built Features Management Plan.

Table 1. Relevant Project Approval Conditions

Condition	Condition Requirement	Section Addressed	
Schedule 3, Condition 3A	The Proponent shall ensure that underground mining does not cause any exceedances of the performance measures in Table 1B, to the satisfaction of the Executive Director Mineral Resources. <i>Table 1B:Subsidence Impact Performance Measures</i>	Section 7	
	<i>Built features</i>		
	66kV transmission line.		Always safe and serviceable. Damage that does not affect safety of serviceability must be fully repairable, and must be fully repaired, unless the owner agrees otherwise in writing.
	Built Features including power lines, forest access roads and tracks, water pipelines and other public infrastructure.	Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repaired or replaced, or else fully compensated.	
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"> a Built Features Management Plan, which has been prepared in consultation with the owner/s of potentially affected feature/s, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings. 	This document	

4.2. Mining Leases

The Project Area is associated with three mining tenements; ML1326; ML1424; and CCL704. Relevant conditions regarding this Built Features Management Plan have been provided in **Table 2**.

Table 2. Relevant Mining Lease Conditions

Mining Lease	Condition Requirement	Section Addressed
ML1326, ML1426 and CCL704	Transmission Lines, Communication Lines and Pipelines Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the area without the prior written approval of the Director General and subject to any conditions he may stipulate.	Section 5.2.3
ML1326, ML1424, and CCL704	Roads and Tracks a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.	Section 8.1
CCL704	Fences, Gates a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate. b) Gates within the lease area must be closed or left open in accordance with the requirement of the landholder.	Not applicable

4.3. Longwalls 930 – 980 SMP Approval

In accordance with the requirements of relevant mining tenements, Angus Place received Subsidence Management (SMP) Approval from the then NSW Department of Primary Industries (now DTIRIS) in December 2005 allowing first workings and secondary extraction within Longwalls 930 - 980. This SMP Approval includes a number of conditions relevant to the management of infrastructure at Angus Place. These conditions and where they have been addressed within this Built Features Management Plan are listed in **Table 3**.

While the SMP Approval for Longwalls 930 – 980 does not relate to the subject Longwalls 900W and 910, **Table 3** has been included to demonstrate that the typical conditions associated with an SMP Approval, specifically those already applicable at Angus Place, have been addressed within this document. This section will be reviewed and revised (if necessary) following receipt of SMP Approval for the Project Area.

Table 3. Relevant SMP Approval Conditions

Condition	Condition Requirement	Section Addressed
13	<p>The Leaseholder shall provide to the Mine Subsidence Board, the owners/operators of any infrastructure and the Director Environmental Sustainability and Principal Subsidence Engineer of the Department of Primary Industries, notification within 24 hours of occurrence or identification of the following during the development of subsidence caused by longwall mining. The same information shall also be made available to other relevant stakeholders if requested.</p> <p>A) Any observed subsidence impacts adverse to groundwater resources and/or the natural environment that may be affected by longwall mining;</p> <p>B) Any observed subsidence impacts adverse to the serviceability and/or safety of infrastructure and other built structures that may be affected by longwall mining;</p> <p>C) Any significant unpredicted and/or higher than predicted subsidence and/or abnormalities in subsidence development in any surface areas that may be affected by longwall mining;</p> <p>D) Any adverse subsidence impacts reported by any relevant stakeholder; and</p> <p>E) Any other relevant information requiring prompt notification</p> <p>Note: Pursuant to paragraph (e) of the subsidence management condition in the leaseholder's Coal Lease, the SMP is also subject to the requirements for subsidence monitoring and reporting set out in the document '<i>New Approval Process for Management of Coal Mining Subsidence – Policy (2003)</i>'. The monitoring and reporting requirements set out in that document apply, as modified by these conditions.</p>	Section 14
15	<p>Infrastructure – The Leaseholder shall develop a management plan to ensure the safety and serviceability of any infrastructure that may be affected by subsidence arising from longwall mining. The management plan shall be implemented to the satisfaction of the owners/operators of the said infrastructure.</p>	This document

5. RELEVANT FEATURE(S) AND PREDICTED IMPACTS

5.1. Relevant Feature(s)

5.1.1. Forest Access Tracks

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**). These are unsealed roads managed by the Forestry Corporation of NSW (FCNSW). Mayinygu Marragu Trail is located above Longwall 910, all other tracks are associated with Longwall 900W.

5.1.2. State Survey Marks

There are six permanent state survey control marks associated with the Project Area. Five state survey marks are associated with Longwall 900W (SSM35265, SSM35268, SSM35269, SSM35273, SSM35274). There is one state survey mark located above Longwall 910 (SSM21323), however this mark has been destroyed. The location of these survey marks is shown in **Figure 2**.

5.1.3. Endeavour Energy 66kV Powerline

There is a 66kV suspended powerline located above the commencing (southern) end of Longwall 900W at Angus Place. This powerline runs in a general northwest - southeast direction over the longwall panel and is owned by Endeavour Energy. The powerline is suspended using timber power poles that are approximately 15 m high. There are five poles (204 – 208) located within the Project Area which are separated by distances ranging from 77 m – 266 m. The location of the Endeavour Energy owned 66kV powerline, in relation to the Project Area has been shown in **Figure 2**.

5.2. Predicted Impacts

5.2.1. Forest Access Tracks

Ditton Geotechnical Services (DgS) were engaged to prepare a *Subsidence Prediction and Impact Assessment* (DgS, 2010) as a component of the Mod 1 EA (RPS, 2010). DgS predict that worst case crack width for forest access tracks within the Project Area is estimated to range between 20 mm – 90 mm. It is expected that approximately 30 m – 50 m 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. Post mining inspections of forest access tracks over the previously extracted longwalls have only found 'hairline' cracking (<1 mm wide) which quickly self-heal following a rainfall event or grading activity.

Some erosion damage may also occur due to changes in drainage paths along the sides of the tracks and the installation of new table drains or possibly culverts across the tracks may be necessary after mining or subsidence is completed (DgS, 2010).

The predicted cumulative subsidence impact parameters for the forest access tracks within the Project Area, as detailed in the *Subsidence Prediction and Impact Assessment* (DgS, 2010) has been provided in **Table 4**.

Table 4. Predicted Cumulative Subsidence Impact Parameters for Forest Access Tracks

Longwall	Panel Width (m)	Cover Depth (m)	Maximum Subsidence (m)	Maximum Tilt (m/m)	Maximum Compressive Strain (mm/m)	Maximum Tensile Strain (mm/m)
900W	293	320	0.80 - 1.47	5 - 12	3 - 6	2 - 5
910	210	370	0.71 - 0.89	7 - 9	5 - 8	4 - 6

5.2.2. State Survey Marks

State survey marks located within the Project Area are expected to experience vertical subsidence ranging from approximately 0.20 m – 1.10 m.

5.2.3. Endeavour Energy 66kV Powerline

DgS (2010) outlines that the poles of the suspended Endeavour Energy 66kV power line are likely to be subject to subsidence of between 0.0 m - 1.0 m, tilts of up to 8 mm/m and tensile or compressive strains of up to 2 mm/m. Power line conductor clearance has been predicted to decrease from 0.0 m to 0.69 m due to mine subsidence (DgS, 2010).

The power poles above the panels are predicted to be subject to transient movements towards the south as the face retreats towards the north, and then move back towards the east or west after full subsidence develops. The poles are also predicted to be subject to tensile and compressive strains associated with the subsidence 'wave' as it passes underneath the poles. DgS (2010) state that the

transient tilts and strains could range from 50% - 70% of the final values, and will be dependent on face retreat rates. The poles outside the mining limits and within the angle of draw are predicted to generally tilt towards the nearest panel rib side as subsidence develops.

Angus Place also engaged Energy Serve to prepare a specific powerline impact assessment, titled *Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery* (Energy Serve, 2013). This assessment concluded that *"the predicted pole movements and subsidence do not pose a problem with either ground clearance or structural integrity of any poles from 204 – 208, contained within the subsidence footprint. No precautionary action is required and remedial action should not be necessary"* (Energy Serve, 2013).

A copy of the *Longwall 900W Powerline Management Plan*, including the *Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery* (Energy Serve, 2013) has been provided as **Appendix 1**.

A report titled *Addendum to Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery* (Energy Serve, 2013a) was also prepared to review the potential subsidence impacts resulting from an increased extraction height within Longwall 900W from 3.25 m to 3.425 m (see **Section 5.2.4**). Energy Serve (2013a) concluded that *"the predicted pole movements and subsidence, associated with the increased height of Longwall 900W, do not pose a problem with either ground clearance or structural integrity of any poles from 204 to 208, contained within the subsidence footprint. No precautionary action is required and remedial actions should not be necessary."* A copy of this report has been provided as Appendix 2 of the *Longwall 900W Powerline Management Plan* (see **Appendix 1**).

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 an 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 four potential risks associated with built features identified during the SMP Risk Assessment which related to: subsidence related impacts to state survey control marks resulting in unauthorised disturbance of survey marker (significant risk); potential for subsidence to exacerbate existing erosion along the powerline corridor (moderate risk); potential for subsidence related damage to the Endeavour Energy powerline resulting in financial liability (low risk); and potential for subsidence related impacts to the powerline resulting in bushfires (low risk). Although the consequence of subsidence impacting state survey marks was ranked as insignificant, the high likelihood (ranked as certain) resulted in the significant risk ranking. Similarly, 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 5**.

Table 5. Risk to Built Features

Risk	Current Controls	Risk Ranking	Recommended Controls
<p>There is a risk to Angus Place from</p> <p>:: Impacts to state survey control marks</p> <p>:::</p> <p>Caused by:</p> <p>Subsidence</p> <p>Resulting in:</p> <p>Unauthorised disturbance of survey marker.</p>	Identification of current state survey markers	Significant	Prepare a Subsidence Monitoring Program for the Project Area.
	Subsidence assessment includes predictions for each asset		
	Existing Subsidence Monitoring and Reporting Program		
<p>There is a risk to Angus Place from</p> <p>:: Existing erosion exacerbated along power line easement</p> <p>:::</p> <p>Caused by:</p> <p>Increased slope angle due to subsidence</p> <p>Resulting in:</p> <p>Environmental impacts.</p>	Water Management Plan including Erosion and Sediment Control Plan.	Moderate	Consultation with Endeavour Energy, including visual inspection of powerlines within the Power Lines Management System.
	Visual inspections documented by GSS Environmental 24/07/12.		Investigate monitoring and remedial requirements with Endeavour Energy.

Risk	Current Controls	Risk Ranking	Recommended Controls
<p>There is a risk to Angus Place from: :::Damage to Endeavour Energy powerlines::: Caused by: Subsidence. Resulting in: Financial liability.</p>	Consultation with Endeavour Energy.	Low	A centreline will be installed prior Longwall 900W secondary extraction.
	Subsidence assessment includes predictions for each asset.		Develop Powerlines Management Plan in consultation with Endeavour Energy.
	Locations of power infrastructure identified.		Engage specialist engineering consultant to develop impact assessment on powerlines and identify appropriate mitigation methods.
	No oil bearing assets in application area.		Visual inspection of powerlines to be included in development of Powerlines Management System.
			Subsidence monitoring regime following powerlines across Longwall 900W block.
<p>There is a risk to Angus Place from: :::Damage to Endeavour Energy powerlines::: Caused by: Subsidence. Resulting in: Bushfires.</p>	Subsidence assessment includes predictions for each asset.	Low	Engage specialist engineering consultant to develop impact assessment on powerlines and identify appropriate mitigation methods.
	Locations of power infrastructure identified.		Subsidence monitoring regime following powerlines across Longwall 900W block.
	Consultation with Endeavour Energy.		Review Angus Place Bushfire Management Plan after Powerlines Management Plan and engineering consultant plans have been completed.
	Angus Place Bush Fire Management Plan.		Visual inspection of powerlines to be included in development of Powerlines Management System.
	Endeavour Energy's vegetation controlling systems.		
	No oil bearing assets in application area.		

To further mitigate subsidence-related risks to built features, Angus Place has implemented the 'recommended controls' as outlined in **Table 4**. To mitigate the risk to state survey marks a subsidence monitoring program has been developed for the Project Area (see **Section 9.2**). Additional detail regarding subsidence monitoring at Angus Place is outlined within the *Longwalls 900W and 910 Subsidence Monitoring and Reporting Program*. The recommendations relating to the powerlines have been addressed in the *Longwall 900W Powerline Management Plan* (see **Appendix 1**).

7. PERFORMANCE MEASURES AND INDICATORS

7.1. Performance Measures

Subsidence impact performance measures for built features at Angus Place are specified in Schedule 3, Condition 3A of PA 06_0021 (as modified). The performance measures for forest access tracks and other public infrastructure include:

- Always safe;
- Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated; and
- Damage must be fully repaired or replaced, or else fully compensated.

The performance measures specifically relating to the 66kV transmission line include:

- Always safe and serviceable; and
- Damage that does not affect safety or serviceability must be fully repairable, and must be fully repaired, unless the owner agrees otherwise in writing.

7.2. Performance Indicators

To establish compliance with the performance measures as outlined in **Section 7.1**, Angus Place has developed a monitoring program. This monitoring program (see **Section 9**), will be used to demonstrate that the environmental performance satisfies the following performance indicators:

- Visual inspections of forest access tracks within the Project Area identify that subsidence related impacts are consistent with predicted impacts as outlined in **Section 5.2.1**;
- Visual inspections of the 66kV powerline to identify that there are no obvious visual abnormalities; and
- Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) are within the limits of the prediction model.

8. MANAGEMENT MEASURES

As per the recommendations of the *Subsidence Prediction and Impact Assessment* (DgS, 2010), the management and mitigation measures outlined in **Sections 8.1 – 8.3** will be implemented by Angus Place during secondary extraction of Longwalls 900W and 910.

8.1. Forest Access Tracks

Angus Place will implement the following management measures to manage subsidence related impacts to forest access tracks 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 (see **Section 9.2**). 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 of surface cracks are required these will be undertaken in accordance with the methodology specified in the approved *Mining Operations Plan* (GSS Environmental, 2013), in consultation with FCNSW.



Plate 1. Warning Sign at Angus Place

8.2. State Survey Marks

The position of the state survey marks within the Project Area are shown in **Figure 2**. The locations and details of the state survey marks were obtained from the Department of Finance and Services – Land and Property Information, via a Survey Control Information Management System (SCIMS) search which was completed on 20 June 2012. A summary of the information obtained for state survey marks within the Project Area from the SCIMS search has been included in **Table 6**.

During consultation between Angus Place and the Survey Infrastructure and Geodesy Officer, Department of Finance and Services – Land and Property Information it has been confirmed that there will be no requirement to resurvey the state survey control marks within the Project Area as they are all of very low accuracy (horizontally and vertically). Details of this consultation have been provided in **Section 10**.

Table 6. State Survey Marks within Project Area

Mark	Status	Height	Vertical Class / Order	MGA Easting	MGA Northing	Zone	Horizontal Class / Order
SSM 21323	Destroyed	1163.016	LC/L3	234435	6305590	56	U/U
SSM 35265	Not found	1160	U/U	232612	6302781	56	U/U
SSM 35268	Subsidence area	1126	U/U	232790.6	6303551	56	E/5
SSM 35269	Subsidence area	1139	U/U	232519.6	6303430	56	E/5
SSM 35273	Not found	1120	U/U	232677	6303954	56	U/U
SSM 35274	Subsidence area	1120	U/U	232755	6303819	56	U/U

8.3. Endeavour Energy 66kV Powerline

As specified in **Section 5.2.3**, the predicted subsidence and pole movements do not pose a problem with either ground clearance or structural integrity to any poles within the Project Area (Energy Serve, 2013). Additionally the specialist assessment prepared by Energy Serve (2013) concluded that “*no precautionary action is required and remedial action should not be necessary*”. Although no precautionary or remedial actions are expected to be required, Energy Serve (2013) recommend that the movement of power poles and the consequent action of the spans should be observed throughout the proposed secondary extraction and subsidence. Accordingly, Angus Place propose to implement a detailed monitoring program for the Endeavour Energy 66kV powerline. This program will be undertaken to confirm that the observed subsidence parameters are consistent with the predictions of DgS (2010) and Energy Serve (2013). This will be achieved by implementing the following measures:

- Implementing a subsidence monitoring program for the 66kV powerline, as detailed in **Section 9.2** that will include;
 - Surveying of the proposed centreline (the ‘I Line’) that will be installed at the commencing end of Longwall 900W;
 - Surveying of fixed survey points (reflectors) near the top and base of each power pole associated with the Project Area (poles 201 – 211);
- Implementing a visual inspection program that will include the use of photo monitoring (see **Section 9.2**). In the event that any obvious abnormalities are identified during an inspection a survey will be triggered;
- Angus Place will prepare and distribute the results of each survey to relevant stakeholders (see **Section 14**);
- In the unlikely event that subsidence monitoring and/or visual inspections identify that a performance indicator has been exceeded, Angus Place will implement the contingency measures as detailed in the Trigger Action Response Plan (see **Table 8**); and
- Following completion of subsidence in the vicinity of the 66kV powerline, the final sags in the spans will be assessed to determine if they need to be corrected.

The management measures specified for the Endeavour Energy 66kV powerline are consistent with the measures specified in the *Longwall 900W Powerline Management Plan*. This document was prepared in consultation with Endeavour Energy and a copy has been provided as **Appendix 1**.

9. MONITORING PROGRAM

9.1. Baseline Monitoring

Baseline monitoring of built features within 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 using a combination of the following methods:

- Installation of subsidence monitoring lines that will be used to monitor the angle of draw, subsidence, tilt and strain. The lines will be surveyed prior to secondary extraction in Longwalls 900W and 910 to establish pre-mining data;
- Installation of fixed survey points (reflectors) near the top and base of each power pole associated with the Endeavour Energy 66kV powerline. These points will be used to monitor subsidence, relative pole movement, change in sag/tensions and variation of anchorage conditions. These points will be surveyed twice prior to secondary extraction within Longwall 900W to establish reliable pre-mining data; and
- A visual inspection program will be 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 forest access tracks and the Endeavour Energy 66kV powerline.

9.2. Monitoring Subsidence Impacts

Built features within the Project Area will be monitored pre and post mining for evidence of any subsidence related impacts. **Table 7** provides a summary of the subsidence monitoring program that will be undertaken to manage these features. Monitoring requirements relevant to the Endeavour Energy 66kV powerline are consistent with the measures specified in the *Longwall 900W Powerline Management Plan*, which was prepared in consultation with Endeavour Energy (see **Appendix 1**). 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 7. 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.
Fixed survey points installed on power poles associated with the Endeavour Energy 66kV powerline	Subsidence, relative pole movement ¹ , change in sag/tensions ² and variation of anchorage conditions ³	Monitoring of reflectors associated with the Endeavour Energy 66kV powerline will be undertaken at the following frequency: <ul style="list-style-type: none"> • Twice prior to commencement of secondary extraction in Longwall 900W; • When secondary extraction of Longwall 900W reaches the following chainages: CH2000, CH1890, CH1820, CH1730, CH1530; • Three months after CH1530 survey; at the completion of secondary extraction within Longwall 900W; and • Six monthly until no significant⁴ difference between successive surveys is detected.
Visual inspections (including photo monitoring) of forest access tracks	Presence of 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 the Endeavour Energy 66kV powerline	Presence or absence of visual abnormalities	Photo monitoring and visual inspections of the powerline will be undertaken at the following frequency: <ul style="list-style-type: none"> • Prior to the commencement of secondary extraction in Longwall 900W; • Weekly from commencement of secondary extraction until Longwall 900W reaches chainage CH1450 (when all poles within the Project Area have been undermined); • Monthly for three months; • Bi-monthly for two inspections; and • Tri-monthly for three inspections.

¹ The relative movement i.e. lean will be determined through a comparison of the bearing and distance (horizontal projection) between the top and bottom reflector from one survey to the next. Total lean will be referenced against the baseline survey bearing and distance.

² A comparison between the 3D coordinates of the reflector at the top of one pole to the next will determine a baseline distance between each pole at the level of the wire attachment point. A change in distance between the tops of the poles will indicate a change in sag and tension of the wires between the two relevant power poles.

³ Variations to anchorage conditions will be measured at a specific point placed on each anchor point. 3D coordinates will be determined for the mark and its movement relative to the reflector at the top of the pole calculated and compared to the baseline survey. The change in slope distance between the anchor point and the top of the pole should indicate any change in anchor tension.

⁴ Significant is defined as being 1.5 times the difference in results from the two baseline surveys.

9.3. Monitoring Environmental Consequences

Angus Place will implement the monitoring program as specified in **Table 7** to monitor the development of predicted subsidence associated with forest access tracks and the Endeavour Energy 66kV powerline. A contingency plan has been developed as a component of this Built Features Management Plan to outline management measures that will be implemented in the event that predicted environmental consequences are exceeded (see **Section 12**).

9.4. Success of Remediation Measures

In the event that remediation of forest access tracks or the Endeavour Energy 66kV powerline is required, Angus Place will undertake rehabilitation in consultation with relevant NSW Government Agencies, FCNSW and Endeavour Energy. During consultation and prior to implementation of any remedial measures, Angus Place will determine the ongoing monitoring requirements.

10. CONSULTATION

In accordance with the requirements of Schedule 3, Condition 3C(g) of PA 06_0021 (as modified), this Built Features Management Plan was provided to FCNSW and the Department of Finance and Services – Land and Property Information, as part of the consultation process on 13 September 2013. No comments have been received regarding this Built Features Management Plan.

In November 2013 this Built Features Management Plan was updated to include the relevant findings as presented in the *Addendum to Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery* (Energy Serve, 2013a) (see **Section 5.2.3**) and the *Subsidence Assessment Review for the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery* (DgS, 2013) (see **Section 5.2.4**). This plan was subsequently re-submitted to FCNSW and the Department of Finance and Services – Land and Property Information for consultation on 15 November 2013.

A response was received from the Department of Finance and Services – Land and Property Information on 21 November 2013 outlining that there were no objections to the development. Additionally it was outlined that Angus Place would not need to resurvey the state survey control marks relevant to the Project Area as they are of very low accuracy (horizontally and vertically). **Section 8.2** of this Built Features Management Plan has been amended to reflect this correspondence.

Evidence of the consultation undertaken during the preparation of this Built Features Management Plan has been provided as **Appendix 2**.

Angus Place submitted the *Longwall 900W Powerline Management Plan* to Endeavour Energy on 28 August 2013. This document was also revised in November 2013 to include the findings of Energy Serve (2013a) and DgS (2013). The revised plan was also re-submitted to Endeavour Energy for consultation on 15 November 2013. Evidence of consultation relating specifically to the Endeavour Energy 66kV powerline has been provided as Appendix 2 of the *Longwall 900W Powerline Management Plan* (see **Appendix 1**).

11. ADAPTIVE MANAGEMENT

Angus Place has developed an adaptive management approach that is designed to avoid repetition of any unpredicted subsidence impacts and/or environmental consequences. 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 indicator is exceeded; and the review of this Built Features Management Plan as necessary (see **Section 15**).

12. CONTINGENCY PLAN

A Trigger Action Response Plan (TARP) has been developed using the performance indicators for built features, as outlined in **Section 7.2**. In the event that subsidence monitoring and/or visual inspections identify that a performance indicator has been exceeded, Angus Place will implement the contingency measures as detailed in the TARP (see **Table 8**).

Table 8. Trigger Action Response Plan for Built Features

Aspect/ Category	Key Element	Trigger Response	Condition Green	Condition Amber	Condition Red
Built Features	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 (DgS, 2010).	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 (DgS, 2010).	Survey monitoring within the Project Area identifies that subsidence parameters (subsidence, tilt and strain) exceed the limits of the prediction model (DgS, 2010).
		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 Built Features Management Plan).
	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 Environment and Community Coordinator (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.
	Survey Monitoring of Endeavour Energy 66kV Powerline	Trigger	Survey monitoring of fixed survey points (reflectors) on relevant power poles identify that measured subsidence and/or relative pole movements are less than the limits specified by the prediction models (DgS 2010, Energy Serve 2013).	Survey monitoring of fixed survey points (reflectors) on relevant power poles identify that measured subsidence and/or relative pole movements are up to, but do not exceed the limits of the prediction models (DgS 2010, Energy Serve 2013).	Survey monitoring of fixed survey points (reflectors) on relevant power poles identify that measured subsidence and/or relative pole movements exceed the limits of the prediction models (DgS 2010, Energy Serve 2013).
		Response	No response required. Continue monitoring program.	No response required. Continue monitoring program.	If subsidence associated with the powerline exceeds the limits of the prediction model, notify the Director-General of DP&I, DTIRIS, Endeavour Energy and the FCNSW 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 Built Features Management Plan).

Aspect/ Category	Key Element	Trigger Response	Condition Green	Condition Amber	Condition Red
Built Features	Evidence of Damage to Endeavour Energy 66kV Powerline	Trigger	Visual inspections of the Project Area identify that there is no evidence of abnormalities to the powerline.	Visual inspections identify potential evidence of abnormalities to the powerline i.e. changes to powerline ground clearance or pole verticality.	Visual inspections identify evidence of abnormalities to the powerline i.e. obvious changes to powerline ground clearance or pole verticality.
		Response	No response required. Continue monitoring program.	<p>Review previous photographic evidence to identify if there have been visual changes to the powerline since the commencement of secondary extraction in Longwall 900W i.e. pole verticality.</p> <p>If the review of photographic evidence identifies that there are no abnormalities, continue monitoring program.</p> <p>If abnormalities are identified, undertake survey monitoring to identify if measured subsidence and/or relative pole movements are within the limits of the prediction models (DgS 2010, Energy Serve 2013).</p> <p>If measured subsidence and/or relative pole movements are within the limits of the prediction models, report the results to the stakeholders specified in Table 9 of the Longwall 900W Powerline Management Plan. Continue monitoring program.</p> <p>If measured subsidence and/or relative pole movements are beyond the limits of the prediction models, undertake management as outlined for Condition Red responses.</p>	<p>Undertake survey monitoring to identify if measured subsidence and/or relative pole movements are within the limits of the prediction models (DgS 2010, Energy Serve 2013).</p> <p>If measured subsidence and/or relative pole movements are within the limits of the prediction models, report the results to the stakeholders specified in Table 9 of the <i>Longwall 900W Powerline Management Plan</i>. Continue monitoring program.</p> <p>If measured subsidence and/or relative pole movements are beyond the limits of the prediction models, notify the Director-General of DP&I, DTIRIS, Endeavour Energy and the FCNSW of exceedance of subsidence predictions.</p> <p>Erect warning signs and danger tape in immediate area.</p> <p>Investigate exceedance of subsidence prediction model.</p> <p>Identify and implement remedial actions in consultation with relevant stakeholders, if necessary.</p>

13. ROLES AND RESPONSIBILITIES

The responsibility for implementation, monitoring and review of the Built Features Management Plan lies with the Environment and Community Coordinator. The ultimate responsibility for the implementation of the Built Features Management Plan lies with the Mine Manager, who shall make appropriate resources available. The roles and responsibilities for this Built Features 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 FCNSW and Endeavour Energy regarding any serviceability issues to forest access tracks or the 66kV powerline arising from subsidence; • Consultation during the review process with relevant stakeholders and distributing this Built Features Management Plan; • Coordinating any remediation work as required in consultation with FCNSW and Endeavour Energy; • Co-ordinating the generation and submission of formal reporting requirements outlined in this Plan (e.g. End of Panel Reports and the Annual Environmental Management Report); and • Reviewing this Built Features Management Plan.
Mine Surveyor	<ul style="list-style-type: none"> • Notifying the Department of Finance and Services – Land and Property Information prior to state survey marks being subsided.
FCNSW	<ul style="list-style-type: none"> • Undertake inspections as required with Environment and Community Coordinator; • Review and assist in preparation of appropriate rehabilitation / remediation / management procedures in consultation with Environment and Community Coordinator; and • Determine appropriate remedial measures in conjunction with Environment and Community Coordinator.
Endeavour Energy	<ul style="list-style-type: none"> • Undertake inspections as required with the Environment and Community Coordinator; and • Determine appropriate remedial measures in conjunction with the Environment and Community Coordinator, if required.

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 (DTIRIS, infrastructure owners) of any built features 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 Built Features 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. 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 Built Features Management Plan will be undertaken in consultation with DTIRIS and relevant stakeholders. Following any changes a copy of the amended Built Features Management Plan will be forwarded to the Executive Director Mineral Resources of DTIRIS and the Director-General of the DP&I for approval.

16. REFERENCES

Angus Place (2011). *Environmental Assessment Response to Submissions*.

Centennial Coal (2008). *Centennial Coal Risk Management Standard (Management Standard – 004)*.

DgS (2010). *Subsidence Prediction and Impact Assessment, Report no ANP_002/1*.

DgS (2013). *Subsidence Assessment Review for the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Centennial Angus Place Colliery*. Report No. ANP-002/7.

Department of Mineral Resources (2003). *Guideline for Applications for Subsidence Management Approvals*.

DP&I (2012) *Draft Guidelines for the Preparation of Extraction Plans*.

EnergyServe (2013) *Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery*.

Energy Serve (2013a) *Addendum to Review of Mine Subsidence Impact of Longwall 900W on Endeavour Energy's 66kV Feeder 811/2 – Springvale Colliery – Clarence Colliery*.

GSS Environmental (2013) *Angus Place Colliery Mining Operations Plan*.

RPS (2010). *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A*.

This page has been intentionally left blank.

Appendix 1: Longwall 900W Powerline Management Plan

This page has been intentionally left blank.

Appendix 2: Stakeholder Consultation



Centennial Coal

Angus Place



15 November 2013

Mr Jason Molquentin
Regional Manager-Macquarie Region
Forests Corporation NSW
PO Box 143
Bathurst NSW 2795

ATTN: Ms Melanie Klootwijk,

Re: Angus Place Colliery Built Features Management Plan

Angus Place provided the Forests Corporation NSW with a copy of the Longwalls 900W and 910 Built Features Management Plan on 13 September 2013 as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan which is being submitted by the end of November.

As a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Angus Place engaged Ditton Geotechnical Services (DgS) to undertake a review of the original *Subsidence Prediction and Impact Assessment* (DgS, 2010) which was prepared as a component of the Environmental Assessment titled *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A* (RPS, 2010).

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 original *Subsidence Prediction and Impact Assessment* (DgS, 2010) assessed potential subsidence effects for Longwalls 900W and 910 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."

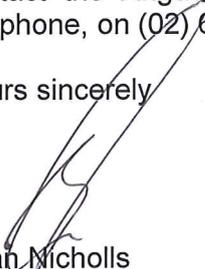
"It is therefore considered that the impact management strategies for the environment and site developments (e.g. access roads and Endeavour Energy 66kV power line) that were outlined in DgS, 2010 are still valid and do not require amendment" (DgS, 2013). The management measures as outlined in Section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

The enclosed Longwalls 900W and 910 Built Features Management Plan has been revised to incorporate the findings of DgS (2013) and has subsequently been resubmitted for consultation. Angus Place requests that any feedback is received by 22 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 with 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

A handwritten signature in black ink, appearing to read 'Brian Micholls', written over a diagonal line that extends from the 'Yours sincerely' text towards the top right of the page.

Brian Micholls
Manager of Mining Engineering
Centennial Angus Place



Centennial Coal

Angus Place



15 November 2013

Mr Peter O'Kane
Senior Surveyor
Department of Finance and Services
Land and Property Information
PO 488G
Newcastle NSW 2300

Dear Peter,

Re: Angus Place Colliery Built Features Management Plan

Angus Place provided the Department of Finance and Services – Land and Property Information with a copy of the Longwalls 900W and 910 Built Features Management Plan on 13 September 2013 as part of the consultation process for the Longwalls 900W and 910 Integrated SMP/Extraction Plan which is being submitted by the end of November.

As a component of the Longwalls 900W and 910 Integrated SMP/Extraction Plan, Angus Place engaged Ditton Geotechnical Services (DgS) to undertake a review of the original *Subsidence Prediction and Impact Assessment* (DgS, 2010) which was prepared as a component of the Environmental Assessment titled *Angus Place Colliery, NSW Modification of Project Approval 06_0021 under Section 75W, Part 3A* (RPS, 2010).

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 original *Subsidence Prediction and Impact Assessment* (DgS, 2010) assessed potential subsidence effects for Longwalls 900W and 910 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).

The enclosed Longwalls 900W and 910 Built Features Management Plan has been revised to incorporate the findings of DgS (2013) and has subsequently been resubmitted for consultation. Angus Place requests that any feedback is received by 22 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 with 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

Loren Yallop

From: Natalie Conroy <Natalie.Conroy@centennialcoal.com.au>
Sent: Thursday, 21 November 2013 11:39 AM
To: Adam Williams; Alan Mellor
Subject: Angus Place Colliery Built Features Management Plan

Follow Up Flag: Follow up
Flag Status: Flagged

Feedback below

Environment and Community Coordinator

 +61 (0) 2 6354 8938

 +61 (0) 467 708 799

 Natalie.Conroy@centennialcoal.com.au

 www.centennialcoal.com.au

 *Be green - read on the screen*



Attention:

This message and any files transmitted with it are confidential and intended solely for the use of those persons to whom the message is addressed. If you have received this message in error please notify the sender immediately and then delete this message. Any unauthorised form of reproduction of this message or any files transmitted with it is strictly prohibited. Any views or opinions presented in this message are solely those of the author and do not necessarily represent those of Centennial Coal Company Limited. The recipient should check this message and any attachments for the presence of viruses. Centennial Coal Company Limited accepts no liability for any damage caused by any virus transmitted by this message.

----- Forwarded by Natalie Conroy/CentennialCoal on 21/11/13 11:38 AM -----

From: "Peter O'Kane" <Peter.O'Kane@lpi.nsw.gov.au>
To: "Natalie.conroy@centennialcoal.com.au" <Natalie.conroy@centennialcoal.com.au>,
Date: 21/11/13 11:25 AM
Subject: Angus Place Colliery Built Features Management Plan

Natalie,

I have read the Management Plan and have no objections to the development. I have changed the status of one survey mark, SS35269 from "F" for Found Intact to "S" for Subsidence area.

The Mine will not need to resurvey survey marks here, as they are all of very low accuracy at this time anyway- horizontally and vertically. The Class/Order of UU on most marks means they are only in SCIMS at plotting accuracy, perhaps 1-10 metres. The E5 on two marks is only accurate to about 0.5 metres.

Peter O'Kane

Senior Surveyor, Hunter

Survey Infrastructure & Geodesy,

T: 02 4925 9984 | M: 0429 034 481 | F: :02 4929 2969 |

E: peter.okane@lpi.nsw.gov.au

Land and Property Information | Level 2, 117 Bull St | Newcastle West NSW 2302

www.lpi.nsw.gov.au | www.six.nsw.gov.au |



Centennial Coal

Angus Place

Angus Place Colliery

PO Box 42

Wallerawang NSW 2845

