Centennial Coal

# Ventilation Facility Project

## Angus Place Colliery

## Briefing Paper

**21 December 2011**

## TABLE OF CONTENTS

**1.0 INTRODUCTION ..... 6**

1.1 BACKGROUND ..... 6
*1.1.1 Introduction ..... 6*
*1.1.2 Proposed Modifications ..... 6*
*1.1.3 Life of Mine Strategy ..... 7*
1.2 MODIFICATION OBJECTIVES AND OVERVIEW ..... 7
1.3 BRIEFING PAPER AIMS AND OBJECTIVES ..... 9
1.4 THE APPLICANT ..... 9

**2.0 EXISTING SITE DESCRIPTION ..... 12**

2.1 SITE LOCALITY AND EXISTING LAND USES ..... 12

**3.0 EXISTING INFRASTRUCTURE AND CURRENT APPROVED OPERATIONS 14**

3.1 BACKGROUND ..... 14
3.2 EXISTING INFRASTRUCTURE AND PRACTICES OF RELEVANCE TO THE MODIFICATION ..... 16
*3.2.1 Mining Method and Equipment ..... 16*
*3.2.2 Current Mine Ventilation System ..... 16*
*3.2.3 Power Supply Infrastructure ..... 17*
*3.2.4 Material and Service Supply Boreholes ..... 17*
*3.2.5 Underground Mine Water Management ..... 17*
3.3 CONSENTS, LEASES AND LICENCES ..... 17
3.4 ENVIRONMENTAL MANAGEMENT SYSTEM ..... 19

**4.0 PROPOSED PROJECT ..... 23**

4.1 BACKGROUND ..... 23
4.2 PROJECT AREA ..... 23
4.3 CONTINUATION OF DEVELOPMENT ACTIVITIES ..... 23
4.4 ANGUS PLACE MINE EXTENSION – VENTILATION SITE 2 PROPOSED DEVELOPMENT ..... 23
*4.4.1 Construction Method and Environmental Considerations ..... 24*
*4.4.2 Operation of APC-VS2 ..... 25*
*4.4.3 Power Supply Infrastructure ..... 26*
*4.4.4 Material/Service Supply Boreholes ..... 26*
4.5 CONSEQUENCES OF NOT PROCEEDING ..... 27

**5.0 PLANNING CONSIDERATIONS ..... 27**

5.1 INTRODUCTION ..... 27
5.2 COMMONWEALTH LEGISLATION ..... 27
*5.2.1 Environment Protection and Biodiversity Conservation Act 1999 ..... 27*
*5.2.2 National Greenhouse and Energy Reporting Act 2007 ..... 28*
*5.2.3 Native Title Act 1994 ..... 28*
5.3 NEW SOUTH WALES STATE LEGISLATION ..... 28
*5.3.1 Environmental Planning and Assessment Act 1979 ..... 28*
*5.3.2 Other NSW State Legislation ..... 28*
*5.3.3 State Environmental Planning Policies ..... 30*
5.3.3.1 SEPP (State and Regional Development) 2011 ..... 30
5.3.3.2 SEPP (Mining, Petroleum Production and Extractive Industries) 2007 ..... 30
5.3.3.3 SEPP 33 – Hazardous and Offensive Development ..... 30
5.3.3.4 SEPP 44 – Koala Habitat Protection ..... 30
5.4 LOCAL ENVIRONMENT PLANS ..... 31

**6.0 KEY ENVIRONMENTAL ISSUES ..... 31**

6.1 IDENTIFICATION OF ENVIRONMENTAL ISSUES ..... 31
*6.1.1 Preliminary Risk Assessment ..... 31*
6.2 IDENTIFIED ENVIRONMENTAL ISSUES ..... 33
*6.2.1 Subsidence ..... 34*
*6.2.2 Flora and Fauna ..... 34*
*6.2.3 Surface Water ..... 35*
*6.2.4 Groundwater ..... 36*
*6.2.5 Greenhouse Gas ..... 36*
*6.2.6 Air Quality ..... 37*
*6.2.7 Noise and Vibration ..... 37*
*6.2.8 Heritage (Aboriginal and European) ..... 38*
*6.2.9 Social ..... 39*
*6.2.10 Soils, Land Capability and Agriculture Assessment ..... 39*
*6.2.11 Traffic and Transport ..... 39*
*6.2.12 Economics ..... 39*
*6.2.13 Visual ..... 39*
*6.2.14 Other ..... 39*

**7.0 STAKEHOLDER AND COMMUNITY CONSULTATION ..... 40**

**8.0 CONCLUSION ..... 41**

## FIGURES

FIGURE 1 – LOCATION PLAN ..... 10

FIGURE 2 – PROJECT APPLICATION AREA ..... 11

FIGURE 3 – STRATIGRAPHY OF THE ILLAWARRA COAL MEASURES ..... 13

## TABLES

TABLE 1 - CURRENT CONSENTS, LEASES AND LICENCES ..... 18

TABLE 2 - SUMMARY OF NSW LEGISLATION RELEVANT TO THE PROJECT ..... 28

TABLE 3 - REQUIREMENTS FOR MANAGEMENT OF RISKS (CENTENNIAL COAL RISK STANDARD) ..... 32

## APPENDICES

APPENDIX 1 –ENVIRONMENT AND COMMUNITY BROAD BRUSH RISK ASSESSMENT ..... 43

## ABBREVIATIONS

| | |
|---|---|
| AHIMS | Aboriginal Heritage Information Management System |
| BANPU | Banpu Public Company Limited |
| BOM | Bureau of Meteorology |
| CCC | Community Consultative Committee |
| CPP | Coal Preparation Plant |
| Centennial | Centennial Coal Company Ltd |
| EARs | Environmental Assessment Requirements |
| DP&I | Department of Planning and Infrastructure |
| EMS | Environmental Management System |
| EP&A Act | Environmental Planning and Assessment Act 1979 |
| EPBC Act | Environment Protection and Biodiversity Conservation Act 1999 |
| EPL | Environment Protection Licence |
| Heritage Act | Heritage Act 1977 |
| ILUA | Indigenous Land Use Agreement |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| LCC | Lithgow City Council |
| MNES | Matters of National Environmental Significance |
| Mtpa | Million tonnes per annum |
| NGER Act | National Greenhouse and Energy Reporting Act 2007 |
| NOW | NSW Office of Water |
| NPW Act | National Parks and Wildlife Act 1974 |
| OEH | NSW Office of Environment and Heritage |
| PEA | Preliminary Environmental Assessment |
| POEO Act | Protection of the Environment Operations Act 1997 |
| ROM | Run of Mine |
| SDWTS | Springvale-Delta Water Transfer Scheme |
| SEPP | State Environmental Planning Policy |

# 1.0 INTRODUCTION

## 1.1 Background

### 1.1.1 Introduction

Angus Place Colliery is situated in the New South Wales western coal field and is managed by Centennial Angus Place Pty Ltd under a joint venture arrangement between Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd. Centennial Angus Place Pty Ltd is 100% owned by Centennial Coal Company Ltd. Centennial Coal Company Ltd is a wholly owned subsidiary of Banpu Public Company Ltd, listed on the Thailand Stock Exchange.

Angus Place Colliery commenced production in 1979, after being developed as an extension of the Newcom Mine at Kerosene Vale. Coal is extracted from the Lithgow seam using longwall mining techniques. The main components of the development are an underground longwall mine and development panels, supporting surface infrastructure (within the Angus Place pit top area and on the Newnes State Forest), a coal stockpile area (Kerosene Vale) and dedicated haul roads to Delta Electricity's Wallerawang and Mount Piper power stations.

Clause 13(h) of the NSW Coal Mines Health and Safety Regulation, 2006 (NSW CMHS Regulation) requires adequate ventilation arrangements to be implemented to operate any underground mine. As such, ventilation arrangements currently enacted at Angus Place Colliery consists of managing two air flows: intake air entering the mine via the pit top drift entries and exhaust air removed from the underground mine via the pit top upcast shaft. The intake and exhaust flow air ensures a continual through flow of fresh air is available underground. At present, there are three air intake shafts situated at the Angus Place pit top. The mine also utilises one ventilation upcast shaft to adequately draw the intake air through underground workings eventually expelling it via the exhaust.

### 1.1.2 Proposed Modifications

It is proposed to develop underground roadways and ventilation shafts from the existing Angus Place Colliery workings to access and mine the potential coal resource to the east of the Wolgan River. The modification proposes to continue development activities beyond the longwall 910 installation face to the area below the proposed ventilation facility. Development activities entail the extraction of coal and installation of strata support to produce underground roadways which would facilitate access to future extraction areas should they prove viable. Continuous miner units are utilised to extract the coal and install roof and rib support bolts. Such development activities are commonly termed 'first workings'. To ensure sustained productivity, mine scheduling has determined that development units will be required to mine roadways to the east of the area below the proposed ventilation shaft site as part of the proposed modification (**Figures 1 and 2**).

Mine planning regarding the Ventilation Facility Project has identified that additional ventilation capacity is required to ensure compliance with Clause 13(h) of the Coal Mine Health and Safety Regulation (2006). To assist with the supply and transport of materials underground and to improve underground safety, it is additionally proposed to situate several service/supply boreholes at the proposed ventilation facility. The boreholes will supply such necessary services as concrete, ballast, stone dust, emulsion, electricity, communications and compressed air. Ancillary infrastructure such as power lines and substations will be required to support the ventilation facility.

The project design phase has determined that in order to maintain adequate ventilation throughout the initial development of the north east area, the proposed ventilation shaft will need to be operational by the time underground development activities mine up to the proposed ventilation shaft site. Such ventilation provisions are essential to ensuring the mine complies with Clause 13(h) of the Coal Mine

Health and Safety Regulation (2006). Without this additional airflow, Angus Place will not be able to operate the development units needed to allow longwall continuity between the current and potential future extraction areas.

As part of the Modification's feasibility assessment, internal ventilation modeling identified several options through which to adequately ventilate the mine extension area. It was determined that the most appropriate, cost effective solution was the construction and operation of an additional surface ventilation facility, known as Angus Place Colliery Ventilation Site 2 (APC-VS2). Underground roadways will also be developed to link the existing mine workings to the proposed ventilation facility.

APC-VS2 and supporting infrastructure is proposed to be situated on the Newnes State Forest that is managed by Forests NSW. The infrastructure has been positioned to fit in with the layout of the proposed underground first workings and existing surface infrastructure such as forest roads and tracks. Environmental constraints have also been investigated in the field to minimise the impact of land preparation. The proposed remote location of APC-VS2 will minimise any potential impacts on the regional community.

Such works require approval in accordance with the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). Angus Place is therefore seeking Ministerial approval under section 75W of Part 3A under the EP&A Act to modify its existing Project Approval (PA06_0021). To support the application for Project Modification, RPS Australia East Pty Ltd (RPS) have been engaged by Angus Place to prepare and manage the coordination of the Environmental Assessment (EA). Several sub-consultants have been engaged to undertake specialist studies in their respective areas of expertise, as described in Section 6.

### 1.1.3 Life of Mine Strategy

A resource area situated to the north-east of the current mine workings has been identified and as such Angus Place is currently undertaking a geological exploration program across the area to determine the extent and viability of the resource. If confirmed, Angus Place will likely apply under a separate approval process to the relevant government departments to extend underground mining operations through continuous miner development and longwall extraction methods. Initial indications show that the north-east project could add approximately 55-60 million tonnes mineable reserve to Angus Place's current coal reserves.

Recently, an additional resource area situated to the north-west of the pit top has also been identified. An extension to the current north-east exploration program has been scheduled to occur during early 2012 to cover this area. Due to the geology and depth of cover, a future application may propose to mine the resource using the bord and pillar development and partial extraction method. The project could add approximately 10 million tonnes mineable reserves as a stand-alone operation following the cessation of longwall mining in the north-east area. An alternative is that the partial extraction operation could supplement the ROM production generated from the longwall extraction method. As with the north-east project, approval to mine this area using the bord and pillar/partial extraction method will be subject to a separate development application.

## 1.2 Modification Objectives and Overview

The overall objective of this Modification is to obtain Ministerial approval to modify existing Project Approval PA06_0021 regarding both the additional mining ventilation infrastructure and supporting ancillary services proposed to be situated on the Newnes State Forest, north of Lithgow NSW.

Every effort will be made by Angus Place to ensure that the proposed development satisfies the principles of ecologically sustainable development (ESD) which is a specific objective of the sought approval pathway under the EP&A Act.

The following activities and infrastructure are proposed to enable the successful construction and implementation of the ventilation facility, known as Angus Place Colliery Ventilation Site 2 (APC-VS2), its supporting infrastructure and the underground first workings. This proposed infrastructure will be in addition to the existing use of the Angus Place Colliery site.

- Development of underground access headings from Longwall 910 up to the proposed ventilation facility site;
- Continuation of first workings to develop gateroads from the ventilation shaft;
- Construction and operation of a ventilation facility, consisting of both upcast (exhaust) and downcast (intake) shafts;
- Implementation of ventilation facility backup generator and an above ground self bunded diesel storage tank (20,000L);
- Construction and operation of an air compressor station;
- Implementation of several surface to mine service boreholes;
- Personnel amenities such as a demountable first aid room and sanitary facilities;
- Permanent hardstand access arrangements and standing areas. Construction of adequate security fencing;
- Water management control ponds;
- Construction of fire tanks to protect assets from bushfire impacts;
- Shaft spoil emplacement area;
- Upgrade of access track from Sunnyside Ridge Road to the proposed ventilation facility;
- Construction and operation of two electrical substations; and
- Provision of electrical power supply from existing overhead power lines to the ventilation facility.
- Switchyard at the existing power line to link to the proposed extension of the electrical power supply.
- Buried cables.
- Boreholes to supply services such as concrete, ballast, stone dust, emulsion, electricity, communications and compressed air.

Refer to **Figure 1** for a site location plan showing the general area of activities described in this Briefing Paper.

## 1.3 Briefing Paper Aims and Objectives

Overall this Briefing Paper aims provide an adequate description of the proposed modification to Angus Place's existing operations. To achieve this aim, key objectives of this Briefing Paper are to brief all stakeholders of the components proposed within the Angus Place Ventilation Facility Project (APVFP). Specific intentions are for the document to act as a précis in anticipation of the Environmental Assessment. As such the Briefing Paper provides a general overview of the Modification with reference to applicable legislation and relevant planning policies. From the pre-project risk assessment, expected environment and community impacts are outlined alongside the proposed level of assessment required to address each risk. Anticipated stakeholder consultation requirements are outlined against the proposed stakeholder consultation plan to act as a framework through which to identify and appropriately consult with stakeholders that may be influenced by or have an interest in the Modification.

The Briefing Paper is generally structured as follows:

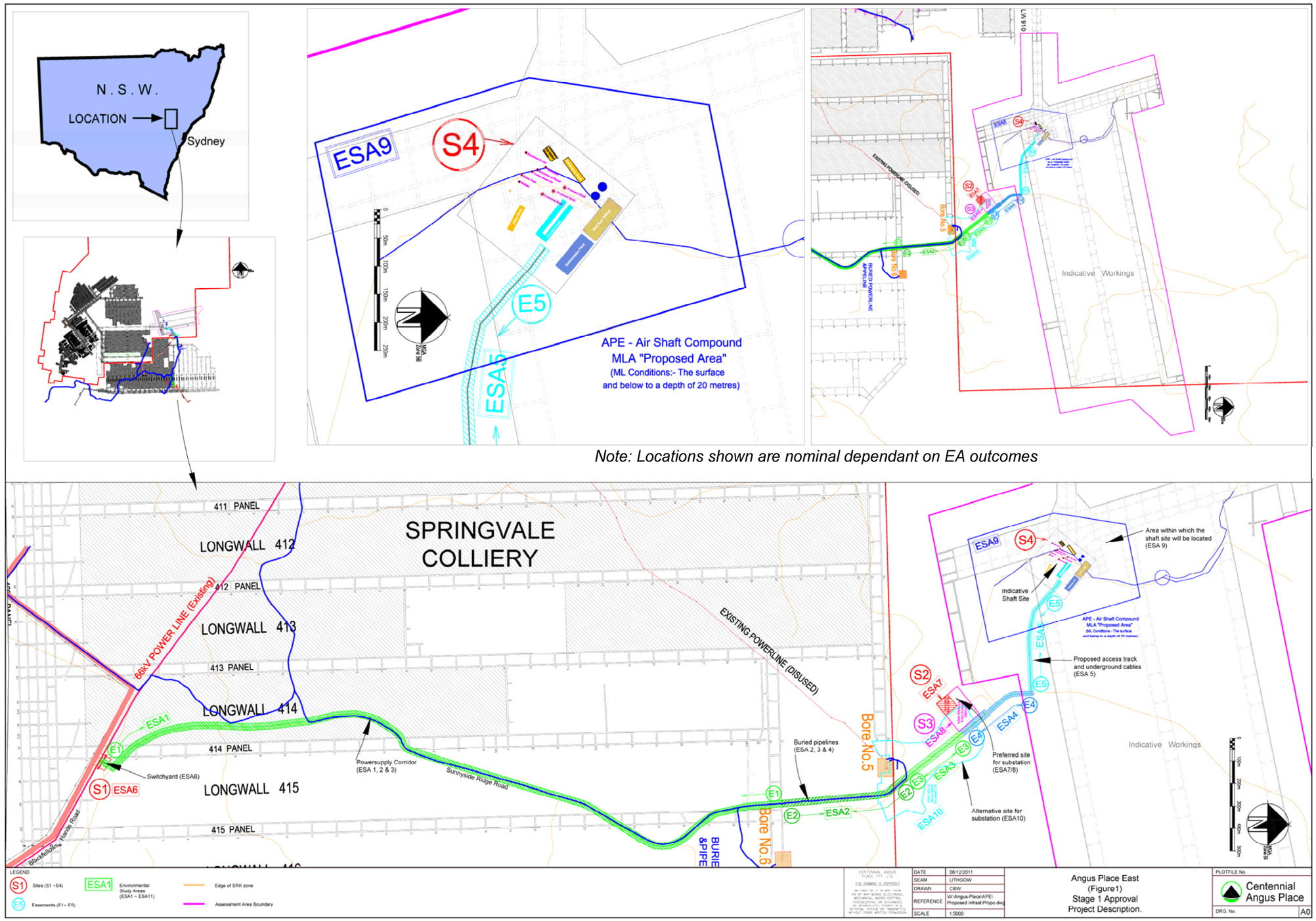
- **Section 2** provides a description of the site and an overview of the existing environment;
- **Section 3** provides an overview of the existing and approved mining operations of Angus Place Colliery;
- **Section 4** provides a detailed description of the Project;
- **Section 5** summarises the legislation relevant to the Project;
- **Section 6** provides an overview of the preliminary environmental risks associated with the Project and describes the proposed assessment methodology for all key environmental issues identified in the preliminary environmental risk assessment for the Project;
- **Section 7** describes the stakeholder consultation program to be undertaken to ensure all interested parties are consulted with regards to the Project; and
- **Section 8** provides some concluding remarks.

## 1.4 The Applicant

Centennial Angus Place Pty Ltd is the proponent for this proposed Modification.

Angus Place Colliery is managed by Centennial Angus Place Pty Ltd under a joint venture arrangement between Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd. Centennial Angus Place Pty Ltd is 100% owned by Centennial Coal Company Ltd. Centennial Coal Company Ltd is a wholly owned subsidiary of Banpu Public Company Ltd, listed on the Thailand Stock Exchange.

Centennial supplies thermal and semi soft coking coal to domestic and export markets, providing NSW with coal for approximately 47% of the State's coal fired electricity.




*Note: Locations shown are nominal dependant on EA outcomes*

**Figure 1 – Location Plan**

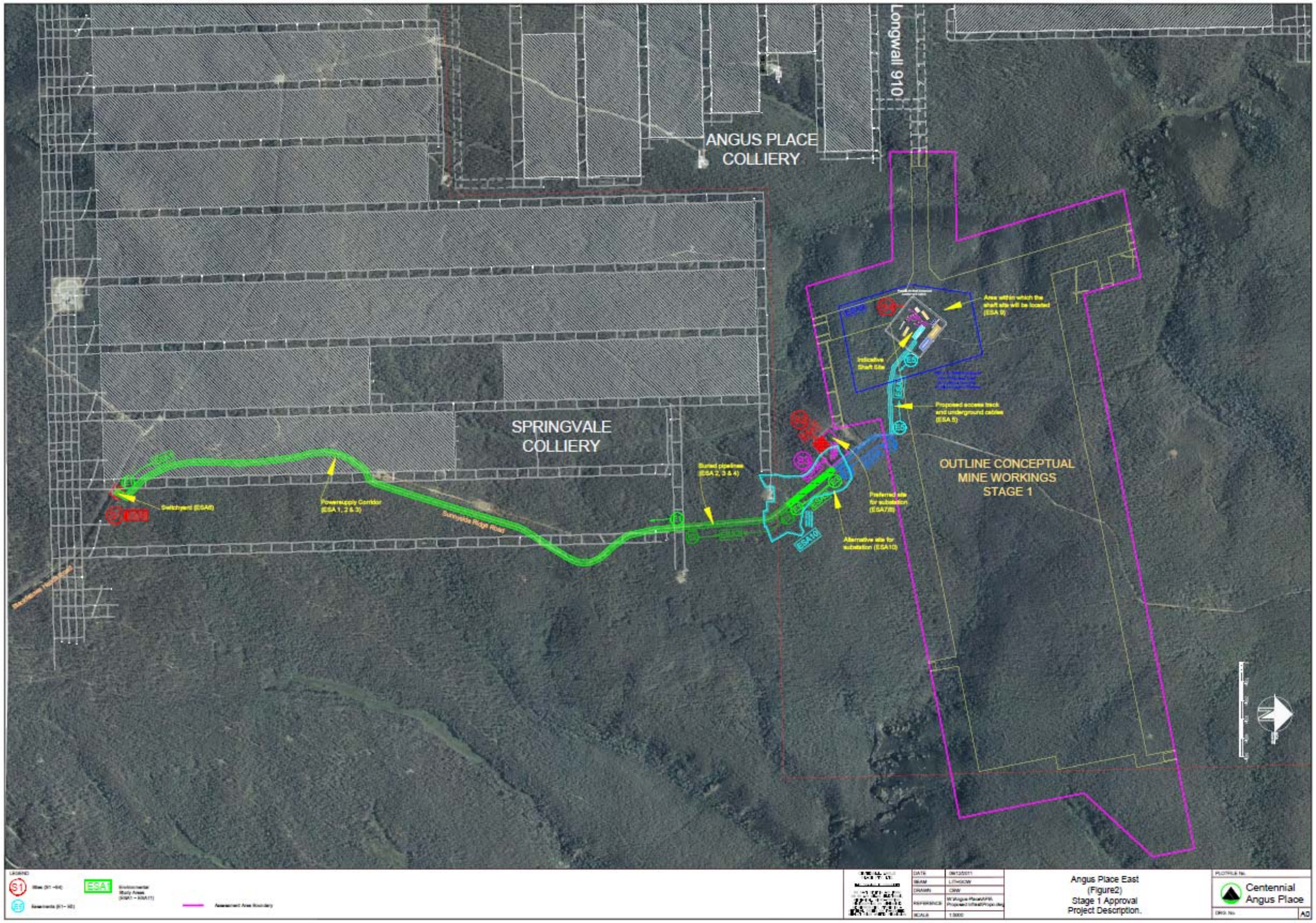



**Figure 2 – Project Application Area**

# 2.0 EXISTING SITE DESCRIPTION

## 2.1 Site Locality and Existing Land Uses

The Angus Place Colliery pit top is located five kilometres north of the village of Lidsdale, eight kilometres northeast of the township of Wallerawang and 15 kilometres northwest of the city of Lithgow. Angus Place Colliery is within the Lithgow City Council Local Government Area (LGA). The underground longwall mine is situated directly below a sandstone plateau of undulating unpopulated bushland which is part of the Newnes State Forest.

Angus Place Colliery is bordered by Baal Bone Colliery (Xstrata Coal Pty Ltd) and Invincible Colliery (CET Resources Pty Ltd) to the north, Springvale Colliery (Centennial Springvale Pty Ltd) to the south and the Wolgan Valley and Newnes State Forest to the north-east. Collectively, existing land uses in the vicinity of the colliery include pastoral farming, open cut and underground coal mining, power generation and commercial forestry. The Angus Place Colliery pit top lies within the Coxs River Catchment, reporting to the Sydney Catchment area. The Colliery Holding Boundary (mining lease area) traverses both the Coxs River Catchment area and Wolgan River Catchment area, the latter of which reports to the Hawkesbury Nepean Catchment.

### 2.2 Landforms and Topography

The surface lands adjacent to and above the Angus Place Colliery underground workings are situated on the Newnes State Forest, which comprises of narrow gorges with high ridgelines, steep sided slopes and sandstone cliffs above incised valleys, hilly areas with relatively flat crests and spurs and moderately sloped ephemeral drainage lines. Streams, such as Kangaroo Creek and the Wolgan River and their tributaries can be found in the vicinity.

### 2.3 Climate

The climate for the Newnes State Forest is classified by the Bureau of Meteorology as warm temperate with an annual rainfall of 1,097 millimetres. Summers are mild with average maximum temperatures of 23.5 °C and winters are cold with average minimum temperatures of -1.0 °C.

Rainfall and temperature tends to be seasonally distributed with the highest falls and the highest temperatures occurring in the summer months, and the lowest rainfall and temperatures experienced during the winter months.

### 2.4 Geology

The Lithgow coal seam lies in the Cullen Bullen Subgroup of the Illawarra Coal Measures (**Figure 3**). The Lithgow coal seam is the major economic coal seam in the Lithgow, Rylstone and Bylong areas and overlies the well-exposed, bench forming outcrops of the Marrangaroo Formation. In the western coalfield, the Lithgow seam ranges in thickness from less than 1m to 9m and consists generally of dull coal with minor bright layers, generally increasing towards the base and top of the formation. Some thin carbonaceous or tuffaceous claystone layers are present in the upper half. The coal measures are overlain by massive sandstone units and conglomerates. The sediments that form the Illawarra Coal Measures were deposited in the late Permian era. The seam is relatively horizontal, however, depth of cover varies considerably due to the surface topography.

| GROUP | FORMATION | COAL SEAMS / SIGNIFICANT UNITS |
|---|---|---|
| NARRABEEN GROUP | | |
| ILLAWARRA COAL MEASURES | WALLERAWANG SUBGROUP | KATOOMBA SEAM<br>Farmers Creek Formation<br>MIDDLE RIVER COAL MEMBER |
| | CHARBON SUBGROUP | ANGUS PLACE SANDSTONE<br>BAAL BONE FORMATION<br>THE NEWNES FORMATION (Upper and Middle Irondale seams)<br>IRONDALE SEAM<br>LONG SWAMP FORMATION |
| | CULLEN BULLEN SUBGROUP | LIDSDALE SEAM<br>BLACKMANS FLAT CONGLOMERATE<br>LITHGOW SEAM<br>MARANGAROO CONGLOMERATE |
| | NILE SUBGROUP | |
| SHOALHAVEN GROUP | | |

**Figure 3 – Stratigraphy of the Illawarra Coal Measures**

### 2.5 Land Ownership

Land ownership within and surrounding the Project Areas include:

- Crown land;
- Privately owned land;
- Land owned and managed by Forests NSW.

The majority of land within the Project Area is Crown Land managed by Forests NSW.

# 3.0 EXISTING INFRASTRUCTURE AND CURRENT APPROVED OPERATIONS

## 3.1 Background

In summary Angus Place Colliery is approved to undertake the following activities:

- **Mining method** - Longwall mining methods are used for the primary extraction of each longwall block. Development headings are mined using continuous miner units, which also install roof and rib support. The Colliery has a current production limit of 4.0 million tonnes per annum.

- **Mining area** - Longwall blocks are mined in sequence. Within the current approved area, Longwalls 930 to 960 have been extracted and Longwalls 970 and 980 are scheduled for extraction between 2011 and 2014. Longwalls 910 and 900W are scheduled for development and extraction following Longwall 980. Development activities within the currently approved area will be complete by February 2013. The extraction area is situated beneath the Newnes State Forest, north of Lithgow NSW.

- **Mine ventilation** - Existing intake ventilation via drifts (main drift, conveyor drift and previous conveyor drift) and return ventilation via a shaft on the pit top site.

- **Mine services** - Existing service boreholes on the pit top site and compressor units on pit top site. Other mine services located on the pit top include dirty and clean water management systems, sewage treatment, licensed mine water discharge points, workshops, storage bays, bathhouse, administration buildings and parking facilities. Power reticulation and access tracks support the operation of these mine services.

- **Mine dewatering** – Groundwater is currently pumped from the underground workings to the surface either by the existing 940 dewatering borehole, for transfer to Wallerawang Power Station. The system which transfers the groundwater from the Angus Place borehole to Wallerawang Power Station is termed the Springvale – Delta Water Transfer Scheme (WTS). One emergency licensed discharge point (LDP006) exists as a contingency when water is unable to be transferred via the WTS. Groundwater collected by underground submersible pumps is pumped to the Angus Place Colliery pit top collector system for surface treatment. Following suitable treatment this water is discharged to Kangaroo Creek, a tributary of the Cox's River via Licensed Discharge Point 001.

- **Production** – Annual extraction limit of 4 million tonnes per annum.

- **Employment** - 225 permanent staff and provision for up to 75 contractors to assist with development activities. Total full time personnel approved from the PA06_0021 Modification 1 is 300 persons.

- **ROM stockpile** - Current stockpile capacity is: pit top site (90,000t) and Kerosene Vale (500,000t). Once conveyed from the underground mine, coal is deposited on the pit top ROM stockpile prior to being crushed and transported offsite or to Kerosene Vale stockpile.

- **Coal preparation** - Coal is crushed on-site at the Angus Place Coal Handling Plant (CHP). Note: No reject material is generated as the coal is not washed.

- **Land preparation** - As Angus Place is a well-established underground mine with adequate supporting infrastructure, minimal land preparation occurs. In recent years, minor land preparation has been undertaken to facilitate the Angus Place Mine Extension Area resource exploration program.

- **Mine Access** - Access to Centennial Angus Place is via an entrance from Wolgan Road. Access into the mine is via existing workings.

- **Product coal transport** – All ROM coal produced is loaded into trucks, from the final product bin after stockpiling and sizing. The trucks transport the coal along two private haul roads to either Wallerawang or Mount Piper Power Stations. The Mount Piper development consent allows for trucking 24 hours/day, 7 days a week – however is limited to 5 loaded trucks per hour between 21:30 and 07:00. Wallerawang is only to be used during the hours of 07:00 to 22:00. Angus Place Colliery is limited to producing no more than 4 million tonnes of ROM coal per calendar year.

- **Site water management** - The surface water management system at Angus Place relies on the separation of clean and dirty water and the treatment of dirty water prior to discharge. Treated water from the sewage treatment facility is irrigated onto the approved utilisation area. Current water management practise occurs in accordance with the Site Water Management Plan.

- **Rehabilitation** - Given that Angus Place exists as an underground coal mine which tends not to alter in footprint, rehabilitation is currently undertaken on the Newnes State Forest following the cessation of exploration activities. Angus Place is in the process of commencing rehabilitation activities at Kerosene Vale and recently undertook a Stage 2 Environmental Site Assessment in accordance with the *NSW Contaminated Land Management Act 1997*. This process will determine if there are any land contamination issues to be managed prior to rehabilitation. A Kerosene Vale Rehabilitation Plan has been prepared and circulated to the Department of Resources and Energy through the Angus Place Annual Environmental Management Report.

- **Operating times –** Angus Place is currently approved to operate activities 24 hours per day 7 days a week.

The existing Angus Place Colliery surface facilities are located adjacent to Wolgan Road, near the village of Lidsdale. The Angus Place Colliery surface facilities include:

- Administration building and portable offices on the pit top site;

- Bathhouse with adequate facilities and services for the intended workforce;

- Coal Handling Plant and coal storage bins;
- Various workshops, service buildings and material storage sheds;
- Visitor and employee parking areas;
- Personnel and materials drift winder for access to underground workings;
- Coal conveyor drift and coal conveyor drive to transport coal from the underground workings to the surface at Angus Place Colliery;
- A ventilation fan installation at the Angus Place Colliery pit top;
- Coal stockpiles at both the Angus Place Colliery pit top and Kerosene Vale site;
- Diesel, solcenic and oil storage facilities;
- A dirty and clean water management control system; and
- Mine dewatering and treatment infrastructure.

## 3.2 Existing Infrastructure and Practices of Relevance to the Modification

### 3.2.1 Mining Method and Equipment

The longwall mining method is utilised at Angus Place Colliery. Longwall mining is a form of underground coal mining where a block of coal is mined using a longwall shearer. In the current mining area at Angus Place Colliery the longwall blocks have typically been approximately 3 kilometres long by up to 287 metres wide at an average depth of cover of 280 - 380m. The longwall mining method is supported by roadway development, mined using continuous miner units. Development activities entail the extraction of coal and installation of strata support to produce underground roadways which enable access to future longwall extraction areas.

In addition to underground mining operations, Angus Place Colliery utilises a variety of other equipment for its operation of the existing surface facilities area and CHP. The types of equipment used for the operation of Angus Place Colliery include equipment used for the coal handling, coal sizing, coal loading and product coal haulage.

### 3.2.2 Current Mine Ventilation System

As an underground coal mine, Angus Place Colliery produces a number of environmental contaminants as part of the operational process (e.g. particulates, dust etc.) and from natural sources (e.g. coal seam gases such as methane and carbon dioxide).

A coal mine requires a ventilation system to dilute and render harmless flammable and noxious gases, provide a means of reducing exposure to unacceptable dust levels and regulating the underground environment. The NSW CMHS Regulation also prescribes certain standards with respect to ventilation.

The current ventilation system at Angus Place consists of three intake drifts (fresh air) and one upcast shaft, on which sits the mine fan. All these surface entry/exits are located on or within the vicinity of the

current Angus Place pit top area. The current mine fan (the Howden fan) operates at approximately 4600 Pa and 230 $m^3$/sec, providing a sufficient quantity to support the operation as it currently stands.

The former mine fan (the Flakt fan) is still serviceable and "in-line" to the ventilation system (parallel to the Howden Fan). It is, however, only operated when the Howden fan has scheduled downtime.

Modeling has indicated that additional ventilation will be required to ensure that minimum standards are maintained across both the current mining area and any future mining areas. Several options have been identified through which to adequately ventilate the mine. It was determined that the most appropriate, cost effective solution was the construction and operation of an additional surface ventilation facility. Underground roadways are proposed to be developed to link the existing mine workings to the proposed ventilation facility.

### 3.2.3 Power Supply Infrastructure

Centennial Springvale currently operates an overhead 66kV power line to power its ventilation shaft No.3 site on the Newnes State Forest. This power line originates from Centennial Clarence Colliery and travels along a separate easement which generally follows the Black Fellows Hands Road and later Beecroft Track.

### 3.2.4 Material and Service Supply Boreholes

Currently there is an existing material borehole situated at the Angus Place pit top used for delivering concrete to the underground workings. Concrete is typically used in underground coal mines to reinforce roadways, construct ventilation overcasts as well as other civil construction works. From the base of the borehole, which is situated at pit bottom, underground vehicles transport the concrete to the required destination. As the roadways are only wide enough to allow the passage of one vehicle in a single direction, the supply of materials throughout the mine clearly impacts on underground logistics. This issue is compounded during shift change-over periods, as there are many vehicles travelling in and out of the mine. Minimising the number of journeys made throughout the mine not only improves the safety of underground personnel and reduces the likelihood of equipment damage but also reduces the quantity of Scope 1 greenhouse gases produced.

Several service boreholes currently exist to provide compressed air, water and communications. All such boreholes are currently situated on the pit top site. Once underground a series of pipelines convey the services to where they are needed throughout the mine. Clearly in the case of compressed air and water, more energy is required to transport each service further throughout the mine. At Angus Place, the generation and conveyance of compressed air underground accounts for a significant proportion of electricity usage which in turn contributes to the total Scope 2 greenhouse gases produced.

### 3.2.5 Underground Mine Water Management

Water is extracted from the underground workings either through the in-seam water management system, which directs water to the Groundwater Collection System on the pit top, or via the 940 dewatering bore which extracts mine water from the low point in the mine to the surface where it is transferred into the Springvale – Delta Water Transfer Scheme (SDWTS). A portion of the mine water pumped to the pit top Groundwater Collection System is discharged via LDP001. Mine water pumped into the SDWTS via the 940 borehole is transferred to Wallerawang power station to be used as part of the cooling process. This importantly reduces the volume of water sourced by the power station from surface rivers and lakes.

## 3.3 Consents, Leases and Licences

Project Approval PA06_0021 is applicable to Angus Place Colliery, which was approved by the DP&I pursuant to a Part 3A application in accordance with the EP&A Act. Project Approval PA06_0021 was

granted on 13 September 2006 to expand the mining area and increase the production limit to 3.5 million tonnes per annum. PA 06_0021 is currently due to lapse on 18 August 2024.

During 2010, Angus Place Colliery submitted an application to the DP&I requesting to modify Project Approval 06_0021 pursuant to Section 75W of the EP&A Act (910/900W modification). This modification proposed an extension to Angus Place's operations through the development and extraction of two additional longwall panels, as well as development of the nominated supporting surface infrastructure. The Modification additionally provisioned to increase the annual production limit from 3.5Mtpa to 4Mtpa. Project Approval 06_0021 Modification 1 was approved on 29 August 2011.

Angus Place additionally holds an Environment Protection Licence, Mining Lease and Consolidated Coal Lease, Exploration Licences, Subsidence Management Plan approval, Groundwater Licences, a Radiation Licence, two Occupation Permits and a Section 95 Certificate.

**Table 1** contains a list of the current consents, leases and licences relevant to Angus Place Colliery.

**Table 1 - Current Consents, Leases and Licences**

| **Consents** | | | |
|---|---|---|---|
| **Reference** | **Description** | **Expiry Date** | **Issued By** |
| **PA06_0021 (Mod1)** | Approved the extension of mining operations at Angus Place Colliery and increased the production limit to 4mtpa and the ability to haul this amount by truck | 18/08/2024 | DP&I |
| **DA105/92** | Held by Coal Link Pty Ltd for the purpose of a private haul route | Perpetuity | Lithgow City Council |

| **Leases** | | | |
|---|---|---|---|
| **Authority** | **Type of Authority** | **Expiry Date** | **Holder** |
| ML1424 | Mining Lease | 18/08/2024 | Centennial Angus Place Pty Ltd |
| CCL702 | Sublease | 24/11/2024 | Coal Pac Pty Ltd |
| CCL704 | Consolidated Coal Lease | 14/01/2023 | Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd |

| **Licences** | | | |
|---|---|---|---|
| **Reference** | **Description** | **Expiry Date** | **Issued By** |
| EPL467 | Environment Protection Licence 467 issued under the Protection of the Environment Operations Act 1997 for mining of coal up to 3.5 million tonnes per annum and coal works | Anniversary 1 January | OEH |
| EL6856 | Exploration licence to permit prospecting activities in accordance with DTIRIS -MR guidelines | 8/09/12 | DTIRIS |

| | | | |
|---|---|---|---|
| EL6293 | Exploration licence to permit prospecting activities in accordance with DTIRIS -MR guidelines | 16/09/14 | DTIRIS |
| 10BL601852 | 930 dewatering bore (decommissioned) | 3/09/12 | NOW |
| 10BL601851 | 940 dewatering bore | 3/09/12 | NOW |
| 10BL601838 | Groundwater collection system | 3/09/12 | NOW |
| 10BL601829 | Newnes Plateau groundwater piezometers | Perpetuity | NOW |
| 10BL603236 | Piezometers across sites AP1PR to AP6PR | Perpetuity | NOW |
| 10BL603802 | Piezometers across sites AP8PR to AP12PR | Perpetuity | NOW |
| 10BL604512 | Licensing of geological boreholes and groundwater monitoring bores | Perpetuity | NOW |
| RR11830 | Radiation licence for coal handling plant fixed radiation gauge | 7/07/2012 | OEH |
| 29229 | Licence to sell/possess under the Radiation Control Act 1990 | OEH | |
| **Approvals** | | | |
| **Reference** | **Description** | **Expiry Date** | **Issued By** |
| SMP Approval | Subsidence Management Approval for longwalls 930 – 980 | Extraction completion | DTIRIS - MR |
| **Permits** | | | |
| **Reference** | **Description** | **Issued By** | |
| Occupation Permits | The Newnes State Forest is located above the majority of the underground workings. To enable Angus Place Colliery to operate under the forest and to build infrastructure and other surface facilities, an Occupation Permit is required from Forests NSW.<br><br>Occupation Permit (PB 28362) is held by Angus Place Colliery and this covers all surface facilities associated with the Colliery that are located on State Forest land. Occupation Permit (PB 03797) extends into the Ben Bullen Forest to the west of the pit top. | Forests NSW | |

## 3.4 Environmental Management System

Angus Place Colliery has an established Environmental Management System (EMS) that has been developed in accordance with the Centennial Coal Environmental Management System Framework (April 2009).

The EMS has been developed and implemented to ensure the effective management of environmental aspects and impacts and compliance with regulatory requirements while providing a means for continued improvement in the environmental performance of the Angus Place Colliery. The EMS incorporates a number of environmental management plans that are designed to assist in meeting community and regulatory expectations.

Angus Place Colliery has the following management plans:

| | |
|---|---|
| • Public Safety Management Plan | This describes the processes developed to ensure Public Safety in any surface areas that may be affected by subsidence arising from longwall mining in the SMP area at Angus Place Colliery. The Management Plan fulfils the requirements of Condition 16 of the Angus Place Subsidence Management Plan Approval. |
| • Infrastructure Management Plan | The Infrastructure Management Plan has been developed to manage the risks to infrastructure as a result of surface subsidence and mining operations. |
| • Kangaroo Creek Management Plan | The purpose is to measure and manage potential subsidence impacts from longwall mining (within the SMP area) on Kangaroo Creek. The Kangaroo Creek Management Plan fulfils the requirements of Condition 2a of the Angus Place Subsidence Management Plan Approval. The document describes the environmental monitoring, reporting program and management to detail how the effects of subsidence on Kangaroo Creek are to be monitored and managed. This includes baseline data collection, investigation, assessment and regular reviews. The program aims to identify appropriate management measures to remediate/mitigate any subsidence impacts. |
| • Land Management Plan | The purpose is to ensure adequate management of any impacts associated with surface cracking, erosion, soil slumping and land degradation caused by subsidence due to longwall mining and/or activities associated with subsidence monitoring or other management actions by Angus Place in the Subsidence Management Plan area. The Land Management Plan has been developed and implemented to comply with the requirements of Condition 20 within PA06_0021. |
| • Environmental Management Strategy | This describes the overall environmental management strategy at Angus Place Colliery. |
| • Environmental Monitoring Program | The Environmental Monitoring Program provides the details of monitoring work and reporting functions in response to the various management plans. The purpose of environmental monitoring is to gather data on the performance of the operation and determine the need for improvements or additional mitigation measures in order to achieve the assessment criteria for the operation. |
| • Subsidence Management Plan | Approval granted from DII. Variations of the SMP were approved by the DII in October 2005, October 2006 and March 2008. |
| • Extraction Plan | Schedule 3 Condition 3C requires Angus Place to develop an extraction plan regarding the secondary extraction of LWs 910 and 900W. This secondary extraction phase is currently scheduled to commence in July 2014 and as such Angus Place will develop the Extraction Plan and seek approval prior to this date. |

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|---|---|
| • Subsidence Community Consultation Process | Angus Place Colliery has as an approved Subsidence Management for longwalls 930 – 980. The SCCP fulfils the requirements of Condition 2c (SMP approval dated 19/01/2007) of the Angus Place SMP Approval. The objectives of this SCCP include:<br>• Developing an effective process to communicate with relevant stakeholders regarding the subsidence from Angus Place activities on the Newnes Plateau;<br>• Defining the responsibilities in respect of the communication paths and forums;<br>• Implementing a system to monitor and manage issues from relevant stakeholders; and<br>• Providing the Angus Place complaints protocols. |
| • Subsidence Management and Reporting Program | The purpose is to provide a subsidence monitoring and reporting program to measure how the effects of subsidence are proposed to be monitored. The program includes monitoring both pre and post mining in Longwalls LW930 – LW980 (the SMP area). This Management Plan fulfils the requirements of Condition 11 and partially fulfils the requirements of Condition 17 with respect to the development of a program to ensure on-going baseline data collection, investigation, assessment and regular reviews with the relevant stakeholders. |
| • Flora and Fauna Management Plan | The purpose of the Flora and Fauna Management Plan is to protect threatened species and communities, minimise impact on native flora and fauna, manage clearing on the site, control weeds, control access to environmentally sensitive areas and manage any potential conflicts between flora and fauna. |
| • Newnes Plateau Shrub Swamp Management Plan | The purpose of this Management Plan is to measure and manage potential subsidence impacts from longwall mining (within the Subsidence Management Plan (SMP) area) on the Newnes Plateau Shrub Swamps at Angus Place. |
| • Air Quality Management Plan | The Air Quality Monitoring Program sets out methods of monitoring dust generated from Angus Place Colliery. |
| • Noise Monitoring Program | This program sets out procedures for monitoring and assessing noise impacts from Angus Place Colliery to acceptable levels for residential neighbours and regulatory stakeholders. A key outcome is that the Noise Monitoring Program needs to demonstrate compliance with the noise level criteria set out in the existing Project Approval. Quarterly noise monitoring is undertaken at residential properties, colliery surface plant and the haul road and additional noise monitoring is undertaken in response to noise complaints. |
| • Site Water Management Plan | This Management Plan aims to coordinate the management of all surface water within the Angus Place Colliery Holding Boundary in an efficient and sustainable manner. Angus Place is proposing to update the Site Water Management Plan during 2012 with regard to an enhanced hydrogeological model and site water balance. |

| | |
|---|---|
| • Groundwater Management Plan | The Groundwater Management Plan aims to coordinate the management of all ground water within the Angus Place Colliery Holding Boundary in an efficient and sustainable manner. |
| • Contractor Environmental Management Plan | The CEMP aims to ensure that all activities carried out on behalf of Angus Place comply with internal and external practices and guidelines for the impacts generated by the proposed activity. |
| • Bushfire Management Procedure and Management of Bushfire Assets Procedure | These set out the procedures for reporting fire and for the inspection and maintenance of firebreaks and asset protection zones at Angus Place Colliery and on the Newnes Plateau. |
| • Wallerawang Haul Road Inspection Protocol | Directs haul road inspections to assess the surface conditions and identify areas requiring maintenance/additional work to repair surface deformations, which may increase noise levels when vehicles pass over them. |
| • Wallerawang Haul Road Landscape Management Plan | The purpose of the Wallerawang Power Station Coal Haul Road Landscape Plan is to provide for the establishment and maintenance of landscaping measures to minimise the visual impacts of the haul road, particularly those from residential areas. |
| • Erosion and Sediment Control Plan | In compliance with Schedule 3, Condition 10 of PA 06_0021, the ESCP has been prepared in accordance with the Department of Housing's Managing Urban Stormwater: Soils and Construction Manual, 2004 (the 'Blue Book'). The ESCP includes the following:<br>▪ Identification of potential sources of sediment;<br>▪ Description of management principles to be implemented;<br>▪ Description of the erosion sediment control structures in place; and<br>▪ Description of measures to be implemented to decommission structures over time. |
| • Rehabilitation Management Plan | A Rehabilitation Management Plan will be prepared in accordance with Schedule 3 Condition 37. This document is to be prepared prior to the secondary extraction of LWs 910 and 900W. |
| • Ventilation Management System | In accordance with Clause 21 of the Coal Mine Health and Safety Regulation 2006, Angus Place has implemented a Ventilation Management System. The objectives of this management system are to ensure as far as reasonably practicable the safety of all persons present at the coal operation with regard to mine ventilation. |
| • Strata Failure Management System | In accordance with Clause 28b (ii) of the Coal Mine Health and Safety Regulation 2006, Angus Place has implemented a Ventilation Management System. The objectives of this management system are to ensure as far as reasonably practicable the safety of all persons present at the coal operation with regard to underground strata. |

These documents provide a framework for the planning of mining operations while considering potential environmental issues and their management on site.

# 4.0 PROPOSED PROJECT

## 4.1 Background

It is proposed to develop underground roadways and a ventilation facility from the existing Angus Place Colliery workings to access and mine the potential coal resource to the east of the Wolgan River. The APVFP modification seeks to construct a ventilation/services installation and associated infrastructure on the Newnes State Forest. Underground roadway drivage (first workings) are also required from the LW910 install face to the base of the shaft site for ventilation purposes.

## 4.2 Project Area

The Project Area for the proposal comprises nine Environmental Study Areas (ESAs) for the proposed surface infrastructure and a Subsidence Assessment Area within which the proposed first workings would be located. The Project Area is identified in **Figure 1**.

## 4.3 Continuation of Development Activities

It is proposed to continue development activities beyond the Longwall 910 installation face to the area below the proposed ventilation facility. Development activities entail the extraction of coal and installation of strata support to provide underground roadways which would facilitate access to future extraction areas should they prove viable. Continuous miner units are utilised to extract the coal and install roof and rib support bolts. Such development activities are commonly termed first workings. The proposed mine design appears as **Figure 2**. No longwall mining is proposed as part of the APVFP Modification. Additionally, there is no proposed change to the mining rate as a result of the APVFP Modification.

## 4.4 Angus Place Mine Extension – Ventilation Site 2 Proposed Development

As previously stated, the principle aim of this Modification is to enable the connection and operation of an additional ventilation facility which is essential to the continued supply of fresh air throughout the underground mine. Coupled within the design of the proposed ventilation site are several boreholes, designed to provide essential materials and services to the underground workings. Approval for the installation of ancillary equipment designed to support the operation of the ventilation site is also being sought.

Following the conclusion of mining within the current SMP application area and Longwall 900 West, it is proposed to investigate an extension of mining within the north east area. The extension warrants a significant enhancement of the existing Angus Place underground ventilation system. At present total mine airflow quantity provided by the existing ventilation fan is approximately 230 $m^3$/sec. From ventilation modeling work undertaken, the required airflow quantity within the Angus Place Mine Extension Area is anticipated to be approximately 210$m^3$/sec at around 5.5kPa.

To enable this required air flow it is proposed to construct and operate an additional ventilation facility on the Newnes State Forest to ensure safe underground working conditions. The Newnes State Forest is managed by Forests NSW and within the proposed locality consists of narrow gorges with high ridgelines, hilly areas with relatively flat crests and spurs and moderately sloped ephemeral drainage lines which contribute to the Wolgan River. An overview of APC-VS2 and surrounding locality is presented in **Figure 1**.

With regard to the configuration of the ventilation shafts, up to three shafts may be required to maintain adequate underground fresh air supplies. The initial shaft will be an upcast shaft, with the second shaft commissioned as an intake.

There shaft drivage options are being investigated of which the selection criterion is dependent on development time constraints, geotechnical risk, cost and environmental impacts. The shaft drivage methods being evaluated are conventional shaft sinking, blind boring and raise boring.

### 4.4.1 Construction Method and Environmental Considerations

The following section provides a description of the Raise Boring and Blind Boring shaft development processes and a discussion of the environmental considerations applicable to each option:

**Raise boring:** aims to produce a circular excavation (shaft) between the surface and existing underground mine workings. A pilot hole is drilled from the surface to the workings; the drill bit is then removed in the workings and is replaced by a reamer head having a diameter with the same dimension as the desired excavation. The head is then rotated and pulled back up towards the surface. The raise bore cuttings generated report to the bottom of the shaft under gravity, where they are loaded out and placed underground. The raise bored shaft is then lined by either remote shot-creting or by lowering a steel lining into shaft followed by the grouting of the annulus between the shaft and liner.

**Blind boring:** produces a circular excavation from the surface to a desired depth below surface by methods analogous to conventional drilling. A pilot is drilled, and the drill string and pilot bit removed; the blind boring head is then attached to the drill string on the surface, the head is then rotated and then lowered down cutting the hole to the desired diameter. Drilling mud with a controlled density is fed into the void above the cutting head to lubricate cutting and balance the hydrostatic pore fluid pressure. Cuttings report to the surface where they are excavated from the process ponds and piled up. On completion of boring, the head is removed on surface, and the shaft liner with a capped bottom is lowered down the hole, displacing the drilling mud. Finally the annulus between the liner and the shaft is grouted. When the liner bottom is excavated by the underground operation, it must be removed to open up the shaft for ventilation purposes.

**Environmental and Process Considerations for Boring:**

**Blind boring:** the environmental consequences from the processes are very similar, however consideration must be made for the cuttings from blind boring reporting to the surface at the drilling site where they are piled or removed. The benefit of piling these cuttings close to the shaft is their accessibility for back-filling when the shaft(s) are decommissioned. The environmental impacts of piling them at the shaft site are visual and the increased risk of sedimentation impacts. However control measures for these can be taken such as adequate bunding and sump construction to prevent accidental release and adequate rehabilitation. As such a blind bore tailings dam has been provisioned for and appears on **Figure 1**. Any waste to be removed from site would be done so by a licensed waste contractor.

**Raise boring:** the cuttings would require either transportation and stowage in underground workings if space was available (which is unlikely) or transportation to the loading point underground, then transportation off the current mine site if the cuttings were cleared via the conveyor system. Once loaded out the cuttings would either be stored at site as fill material or be removed from site via a licensed waste contractor.

**Summary:** operationally, blind boring is advantageous due to enabling shaft development in parallel with development to the area; blind boring allows the shaft and ventilation infrastructure to be installed and ready for immediate use when the underground workings get to the area.

Both shaft development methods require pressure grouting of the strata in the immediate shaft vicinity prior to shaft sinking to stabilize the strata. All shafts will be fully lined.

Greenhouse gas emissions resulting from cuttings removal via diesel machinery would be less for blind boring if the cuttings remain on the site due to the transportation movements associated with raise bore cuttings out of the mine and off site.

### 4.4.2 Operation of APC-VS2

Following the construction phase it is proposed to decommission and rehabilitate all infrastructure/disturbed areas which are no longer required to support the operational phase. Such activities are proposed to be addressed in the Soil and Land assessment as a component of the rehabilitation strategy.

The following options depend on excavation diameter stability, environmental approval timeframes and capital cost (including associated operational costs).

Option 1

- Raise bore first shaft for upcast development ventilation;
- Raise bore second shaft for downcast longwall ventilation.

Option 2

- Blind bore first shaft for upcast development ventilation;
- Blind bore second shaft for upcast longwall ventilation with first shaft converted to downcast.

Option 3

- Raise bore first shaft for upcast development ventilation;
- Blind bore second shaft for downcast longwall ventilation.

Current approval timeframes indicate that a blind bore ventilation shaft will not be complete in time to allow the forecasted additional development units to be operated. Mine planning has determined that in order to ensure longwall continuity, development rates must be optimised to develop gateroad 910 North (to the north of Longwall 910) to the area below the proposed shaft site (**Figure 1**). Minimum ventilation requirements for NSW coal mines are stipulated under the Coal Mine Health and Safety Regulation (2006). Mine planning has determined that adequate ventilation conditions will be achieved through the use of existing infrastructure to the area situated below the proposed shaft site. From here development activities are scheduled to form roadways from the shaft site and will require enhanced ventilation achieved only through the operation of the proposed additional shafts. Without the additional air flow, Angus Place would not achieve the minimum ventilation requirements and as such this would limit the number of scheduled development units.

The additional electricity substation would continue to provide power for the operation of the ventilation infrastructure over the life of the Project.

A self bunded diesel tank situated on the site would power the backup generator in the event of a mains power failure. From experience, lightning strikes can occasionally cut the power supply warranting a backup system to ensure safe underground working conditions. As part of this Modification it is proposed to operate a backup system in the event of a power outage.

### 4.4.3 Power Supply Infrastructure

From the existing 66kV overhead powerline which runs adjacent to the Blackfellows Hands Road, it is proposed to initially construct a switchyard at the branch from the existing 66kV overhead line approximately 4.5km south of the shaft site. The site for this switchyard is at the junction between Blackfellows Hands Road and Sunnyside Ridge Track. From the switchyard, a 66kV supply, following Sunnyside Ridge Road for approximately 4.4km, to the proposed switchyard and substation itemised below (**Figure 1**).

A 66kV/11kV substation (15MVA) is proposed to be located on the northern end of the Sunnyside Ridge Road Plantation approximately 600m to the south-east of the proposed fan site (**Figure 1**). An alternative substation site has also been identified as the preferred site remains subject to further engineering and environmental assessments.

Two 11kV buried feeder cables are proposed to extend from the Sunnyside Ridge Road plantation substation to the proposed shaft site. An additional feeder will extend only a short distance from the Sunnyside Ridge Road substation to the junction between Sunnyside Ridge Road and the proposed shaft site access track. This is a provision to supply power to future dewatering installations proposed for the Angus Place Mine Extension Project (**Figure 1**).

Appropriate protective fencing and signage, in line with relevant standards, will be installed as public and personnel safety measures regarding the 66kV supply switchyard compound, Sunnyside Ridge Road Plantation substation, proposed shaft site substation and overhead powerlines.

### 4.4.4 Material/Service Supply Boreholes

To assist with the supply and transport of materials underground and to improve underground safety, it is additionally proposed to situate several service/supply boreholes at the proposed ventilation facility. The boreholes will supply such necessary services as concrete, ballast, stonedust, emulsion, electricity, communications and compressed air. Minimising the number of journeys made throughout the mine not only improves the safety of underground personnel and reduces the likelihood of equipment damage but also reduces the quantity of Scope 1 greenhouse gases produced.

Within the proposed Ventilation Facility compound, several small diameter boreholes will be established due west of the proposed ventilation shaft. It is anticipated that the boreholes with be 200-300mm in diameter, fully cased and will be of a similar depth to the shaft in order to extend to the mine workings. The various material/services boreholes include:

- Concrete borehole (including bunded deposition area);
- Ballast borehole;
- Stonedust supply borehole;
- Emulsion supply and diesel supply borehole;
- Borehole to supply electrical power;

- Communications borehole (isolated to avoid interference); and
- Compressed air borehole from the proposed surface compressor to the underground mine.

It is additionally proposed to establish a self bunded emulsion (solcenic) mixing and supply plant and ventilation monitoring station within the ventilation infrastructure compound. Specifically, the Maihak tube bundle atmospheric monitoring system is to be relocated from current pit top office block location to the proposed new shaft site. This will is to be housed within a shipping container. Tube bundle system will be run down the shaft or one of the service boreholes and enables underground atmospheric monitoring, thereby improving the safety of the personnel in the mine.

The indicative layout appears on **Figure 1**.

## 4.5 Consequences of Not Proceeding

In the event that the proposed modifications do not proceed, Angus Place will likely cease operations following the extraction of Longwall 910. Based on the current mine schedule this is forecast for March 2016.

# 5.0 PLANNING CONSIDERATIONS

## 5.1 Introduction

The Modification will be assessed in full consideration of the applicable statutory planning instruments of the Commonwealth and State, as well as associated planning and environmental frameworks. This section describes the statutory planning instruments relevant to the proposed modification, and assesses their implications in relation to the required approval process.

It has been identified that this Modification is subject to assessment under Section 75W of the EP&A Act 1979. As such upon receipt of the application the Minister for Planning and Infrastructure or their delegate will be requested to confirm this pathway and if satisfactory issue Environmental Assessment Requirements (EARs) to guide the Environmental Assessment process.

## 5.2 Commonwealth Legislation

### 5.2.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) came into effect on 16 July 2000 and is administered by the Commonwealth Department of the Sustainability, Environment, Water, Population and Communities (SEWPaC). Part 3 of the EPBC Act states that an action that has, will have or is likely to have a significant impact on a Matter of National Environmental Significance (MNES), may not be undertaken without prior approval of the Minister for SEWPaC.

Angus Place is aware that there are Temperate Highland Peat Swamps on Sandstone (THPSS) within the vicinity of the Project Area that may be potentially impacted by the development. THPSS are listed as an Endangered Ecological Community (EEC) under the EPBC Act. There is also the potential for other listed flora and fauna species to be located within the project application area. This will be considered within the Environmental Assessment to determine if referral under the EPBC Act is warranted.

### 5.2.2 National Greenhouse and Energy Reporting Act 2007

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) provides a single National framework for the reporting and dissemination of information regarding greenhouse gas emissions, greenhouse gas projects and energy use, and production by corporations. The NGER Act mandates registration and reporting by corporations whose energy production or use, or greenhouse gas emissions meet specified thresholds. Centennial reports emissions from the corporation which includes emissions from the Angus Place Colliery.

### 5.2.3 Native Title Act 1994

The Native Title Act 1994 recognises that Aboriginal people have rights and interests to land which derives from their traditional laws and customs. Native title rights can include rights to: live on the land, access the land for traditional purposes, protect important places and sites, collect food and medicinal resources from native plants, hunt and fish, teach traditional law and customs, and to have input into land use practices and development planning. Native title can be negotiated in two ways; through a Native Title Claim (applications and determinations), or through an Indigenous Land Use Agreement (ILUA).

An ILUA is an agreement between a native title group and other parties who use or manage the land and waters. The ILUA process allows for negotiation between indigenous groups and other parties over the use and management of land and water resources, and the ability to establish a formal agreement. An ILUA is binding once it has been registered on the Native Title Tribunal's Register of Indigenous Land Use Agreements.

The land within the project application area is subject to an Ancillary Deed with the Gundungurra Tribal Council Aboriginal Corporation and as such is bound those terms outlined in the Ancillary Deed.

## 5.3 New South Wales State Legislation

### 5.3.1 Environmental Planning and Assessment Act 1979

The environmental impact assessment and approval system in NSW is set out in Parts 3A (repealed), 4 and 5 of the EP&A Act. With the repeal of Part 3A, amendments to the EP&A Act or regulations enable applicants wishing modify an existing Part 3A approval to continue to be assessed under the Part 3A system. As Angus Place has an existing Part 3A Project Approval the modification pathway being sought is Section 75W of the EP&A Act.

A new assessment system for projects of genuine State significance came into effect on 1 October 2011 under Part 4; Division 4.1 of the EP&A Act. The State significant assessment system establishes two separate assessment pathways known as State significant development (SSD) and State significant infrastructure (SSI). Projects that fall into these categories are assessed by the Department of Planning and Infrastructure. All NSW coal mining developments are deemed a State significant development under Schedule 1(5) of the NSW State Environmental Planning Policy (State and Regional Development) 2011. For SSD Projects, the Minister of Planning and Infrastructure has delegated the determination authority to the NSW Planning and Assessment Commission under Part 4; Division 4.1 of the EP&A Act.

### 5.3.2 Other NSW State Legislation

The provisions and requirements of additional NSW legislation will be considered and addressed within the EA. A summary of potentially relevant Acts is included in Table 2.

**Table 2 - Summary of NSW Legislation Relevant to the Project**

| Act | Relevance to the Project |
|---|---|
| Protection of the Environment Operations Act 1997 (POEO Act) | The POEO Act is administered by the DECCW and requires licensing for environmental protection, including waste generation and disposal, water, air and noise pollution. Under the POEO Act, an EPL is required for premises at which a scheduled activity is conducted. Schedule 1 of the POEO Act lists activities that are scheduled activities for the purposes of the Act.<br><br>Angus Place Colliery operates under EPL 467. |
| Mining Act 1992 | Angus Place Colliery current holds Consolidated Coal Lease 704 (CCL704), CCL702 as a sublease and Mining Lease 1424 (ML1424). New mining leases may be required in certain areas of the Angus Place Mine Extension Project. |
| Water Management Act 2000 and Water Act 1912 | The Water Management Act 2000 (WMA) and the Water Act 1912 are administered by the NSW Office of Water (NoW) and contains approval requirements for some developments to protect watercourses from any adverse effects resulting from works within or in proximity of these watercourses.<br><br>The WMA is relevant to this Project as the Project Application Area is within the Greater Metropolitan Water Sharing Plan (WSP) – groundwater sources and unregulated rivers (surface water). The WSP is situated with the Sydney Basin Richmond Groundwater Source, the Sydney Basin Coxs River Groundwater Source, the Hawkesbury and Lower Nepean Rivers Water Source / Colo River Management Unit / Colo River Catchment Sub Zone and the Upper Nepean & Upstream Warragamba Water Source / Wywandy Management Zone.<br><br>Section 91 of the WMA details activity approvals to be considered with regard to developments proposed within a WSP. The two activity approvals stipulated under Section 91, namely controlled activity approvals and aquifer interference approvals, will be investigated for applicability.<br><br>Angus Place Colliery holds several water licences issued under the Water Act 1912. |
| National Parks and Wildlife Act 1974 (NPW Act) | The National Parks and Wildlife Act 1974 (NPW Act) is administered by the National Parks and Wildlife Service (NPWS) and provides for the establishment, care, control, and management of National Parks, historic sites, nature reserves, State conservation areas, Aboriginal areas, and State game reserves. An archaeological survey will be conducted as part of the EA, which will identify the presence of any known Aboriginal sites, as well as strategies for the management and mitigation of any identified impacts on such sites. |
| Heritage Act 1977 | The purpose of the Heritage Act 1977 (Heritage Act) is to protect and conserve non-indigenous cultural heritage, including scheduled heritage items, sites, and relics. The Heritage Act is administered by the NSW Heritage Office within DoP.<br><br>The archaeological survey to be undertaken as part of the Environmental Assessment will identify any items of heritage significance in the Project Site and recommend appropriate |

| Act | Relevance to the Project |
|---|---|
| | management strategies if and where required. |
| Threatened Species Conservation Act 1995 | The Threatened Species Conservation Act 1995 (TSC Act) provides for the conservation of threatened species, populations, and ecological communities of animals and plants.<br><br>Although no detailed ecological assessment has been carried out over the project application area, Angus Place is aware that there are populations of threatened species and endangered ecological communities above the proposed mining area. In particular both Newnes Plateau Shrub Swamps have been detected within the proposed mining area that may be potentially impacted by subsidence. Such species and communities will be considered within the Environmental Assessment.<br><br>The Environmental Assessment will identify any threatened species in the Project Site, as well as strategies for the management and mitigation of impacts. |

### 5.3.3 State Environmental Planning Policies

The following State Environmental Planning Policies (SEPPs) will be considered as part of the Environmental Assessment for the Angus Place Mine Extension Project.

#### 5.3.3.1 SEPP (State and Regional Development) 2011

SEPP (State and Regional Development) defines certain developments that are of state and regional significance requiring assessment under Part 4; Division 4.1 of the EP&A Act and determination by the Minister for Planning and Infrastructure or delegate. Schedule 1 of the SEPP identifies development for the purpose of mining as a project to which Division 4.1 applies.

#### 5.3.3.2 SEPP (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Mining) recognises the importance of mining, petroleum production, and extractive industries within the State. Clause 7 of SEPP (Mining) identifies development which can be carried out only with development consent, and includes 'underground mining carried out on any land' and 'facilities for the processing or transportation of minerals' mined from that land or adjoining land.

#### 5.3.3.3 SEPP 33 – Hazardous and Offensive Development

SEPP 33 – Hazardous and Offensive Developments requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. The aim of this policy is to link the permissibility of a proposal to its safety and pollution control performance. The assessment process establishes whether the proposal is potentially hazardous and if this is not the case, SEPP 33 is not applicable. If the storage of Dangerous Goods is required, then a licence will be applied for from the WorkCover Authority NSW.

#### 5.3.3.4 SEPP 44 – Koala Habitat Protection

The aim of State Environmental Planning Policy 44 – Koala Habitat Protection (SEPP 44) is to encourage the 'proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.' Schedule 1 lists the LGAs to which SEPP 44 applies, and requires an

investigation be carried out to determine if 'core' or 'potential' Koala habitat is present and is likely to be disturbed. Greater Lithgow LGA is listed in Schedule 1 of SEPP 44.

SEPP 44 applies to the extent that a consent authority is restricted from granting development consent from proposals on land identified as core koala habitat without the preparation of a Plan of Management. The potential for the Project to impact on land identified as core koala habitat will be assessed as part of the Environmental Assessment for the Project.

## 5.4 Local Environment Plans

The proposed mining area associated with the Angus Place Mine Extension Project is located within the Lithgow City Council GA. The zoning for land use under the Lithgow City Council Local Environmental Plan (LEP) that applies to the Angus Place Mine Extension Project Area is Zone 1(c) Rural (small holdings) and Zone 1(f) Rural (Forestry).

# 6.0 KEY ENVIRONMENTAL ISSUES

## 6.1 Identification of Environmental Issues

The key project-related issues warranting detailed assessment in the Environmental Assessment will be identified through:

- The existing environmental context of the Project Application Area and surrounding locality;
- The legislative framework applicable to the Project;
- A preliminary environmental risk assessment, which has already been completed;
- The outcomes of consultation to be undertaken with government agencies and other relevant stakeholders; and
- Specialist studies completed as part of the preparation of the Environmental Assessment.

The outcomes of the preliminary environmental risk assessment, including the issues identified for further detailed assessment in the EA, are discussed in Section 6.2 below. These issues will form the basis of the EA, subject to the outcomes of consultation with government agencies, including the EARs, as well as outcomes of the specialist assessments as they progress.

### 6.1.1 Preliminary Risk Assessment

The preliminary identification and assessment of hazards and risks (aspects and impacts) associated with the Modification is required to provide direction and context for the various components associated with the Environmental Assessment. The outcomes gained in terms of risk ratings and recommended controls will specifically guide the development of the assessment work scopes.

The primary objectives of the environment and community risk assessment included:

- Identifying those issues relating to the Project that represent the greatest risk to the local environment and community;
- Determination of the consequence of the issue occurring;

- Determination of the likelihood of the issue occurring;
- Assessment of the risk by determining the probability (likelihood) and consequence (effect) of each hazard/impact; and
- Assisting in setting the level of assessment required to address each identified risk within the Environmental Assessment.

Centennial Coal's Risk Management Standard Risk Matrix is used to calculate the consequence and likelihood of an event to evaluate the subsequent risk level (risk rank). This system operates in accordance with AS/NZS 4360:2004. A comprehensive preliminary environment and community risk assessment was facilitated on 5 May 2011.

The issues that were specifically assessed in the risk assessment include:

- Flora and Fauna
- Aboriginal/Cultural Heritage
- European Heritage
- Noise
- Air Quality
- Traffic
- Visual Impact
- Cumulative Impact
- Social Impact
- Erosion/sedimentation
- Bushfire
- Waste
- Surface Water
- Groundwater
- Water Management
- Subsidence
- Greenhouse Gas
- Surface Infrastructure
- Land Clearance
- Cliff lines and rock features
- Economic Impact
- Community and Public Safety
- Rehabilitation
- Soil and land

Once they were identified, the various project risks were assessed in light of the mitigation measures and management strategies already in place (i.e. documented in management plans and operational procedures). Where the risks were considered unacceptable, or a knowledge gap was identified in the information available, specialist consultants will be engaged to undertake further assessments and to present additional mitigation measures that may be required.

A Risk Assessment report, including a risk register, was prepared to document the outcomes of the risk assessment, and is attached as **Appendix 1**. A summary of the Centennial Coal risk matrix used and the management requirements in accordance with the Centennial Risk Standard and Risk Matrix is provided in Table 3.

**Table 3 - Requirements for Management of Risks (Centennial Coal Risk Standard)**

| Risk Ranking | Risk Category | | Generic Management Actions |
|---|---|---|---|
| 1 to 4 | E | Extreme | Immediate intervention required from senior management to eliminate or reduce this risk. |
| 5 to 9 | H | High | Imperative to eliminate or reduce risk to lower level by the introduction of control measures. Management planning required at senior level. |
| 10 to 15 | S | Significant | Corrective action required, senior management attention needed to eliminate or reduce risk. |
| 16 to 19 | M | Moderate | Corrective action to be determined, management responsibility must be specified. |
| 20 to 25 | L | Low | Monitor and manage by corrective action were practicable. |

The risk assessment identified two 'extreme' issues being environment and community impacts resulting from both the construction of the ventilation facility and the construction of the supporting surface infrastructure. To ensure each phase is adequately assessed in the Environmental Assessment several recommended controls were determined to direct the additional assessment work and to enable the specialist consultants to identify suitable mitigation measures.

The risk assessment identified one 'high' issue being no development approval resulting in mine closure.

Significant environment and community risks identified are detailed below:

- Subsidence impacts resulting from the proposed first workings were initially identified as a 'significant' environmental risk, as at the time of the risk assessment no subsidence modelling data was available to predict impacts.

- The impact of scope 1, 2 and 3 greenhouse gas (GHG) emissions being emitted to the atmosphere was also identified as a 'significant' risk to the project.

- The issue of the extension project holistically creating community angst was recognised as a significant risk of the project, requiring a high level of community engagement to manage the issue.

- Environment and community impacts resulting from both the operation of the ventilation facility and the operation of the supporting surface infrastructure were considered significant. To ensure each phase is adequately assessed in the Environmental Assessment several recommended controls were determined to direct the additional assessment work and to enable the specialist consultants to identify suitable mitigation measures.

- Finally inadequate rehabilition was recognised as a signficant risk requring both adequate assessment and stakeholder consultation.

One moderate issue was identified, relating to the impact of subsidence on surface infrastructure resulting from the development of the first workings. Several recommended controls were derived to manage the issue.

Potential impacts to creek/river geomorphology or sedimentation issues form subsidence and impacts to soil, land and agriculture were ranked as a 'low' risks from the project.

## 6.2 Identified Environmental Issues

The environmental issues identified during the environment and community risk assessment, and how they will be assessed in the EA, is discussed in the sections below.

### 6.2.1 Subsidence

Subsidence created by the first working development activities will be assessed by a suitably qualified subsidence engineering consultant, who will be requested to:

- Initially review existing subsidence data (predictions verses actual) gained from the current SMP Application area, as well as that gained from the 910/900W predictions and the Springvale longwalls beneath part of the Project Area and impact assessment report regarding first workings only;
- Generate a site specific geotechnical model and define surface and subsurface features for the study area;
- Gain site specific predictions (worst case) for subsidence, tilt and strain profiles for the mapped first workings;
- Develop credible worst case scenarios for impact assessment based on a site specific geotechnical model and consideration of site specific features (such as the Wolgan River);
- Develop the impact parameter i.e. angle of draw for subsidence emanating from the first workings considering the area's geotechnical properties;
- Provide predictions of surface impacts as based on some of the outcomes from the risk assessment i.e. cracking, sedimentation erosion issues, groundwater interactions attributable to subsurface fractures, surface water interaction, proposed/existing infrastructure; and
- Make recommendations for impact management and appropriate minimisation strategies.

### 6.2.2 Flora and Fauna

Clearing activities, as identified from the risk assessment process, poses an extreme environmental risk if not adequately assessed and managed. To this end, Angus Place will appoint a suitably qualified consultant to assess the ecological risks posed by the development and determine suitable mitigation measures. Specifically the ecological assessment work will focus on the following areas in addition to the impacts of clearing:

- Subsidence predictions from first workings. Impact assessment informed by assessments for subsidence, groundwater, surface water and soils and land (regarding land stability and sedimentation and erosion issues).
- Depressurisation of groundwater aquifers. Impacts on any present groundwater dependant ecosystems will be assessed based on the outcomes of the groundwater assessment.

Construction:

- Impacts from the construction of the ventilation facility and site services, in particular clearance of vegetation and habitat removal. Include consideration of fragmentation and the creation of any barriers, weeds and an offset strategy.

- Impacts from construction of supporting surface infrastructure (powerlines, pipelines, substation etc) in particular clearance of vegetation and habitat removal. Include consideration of fragmentation and the creation of any barriers, weeds and an offset strategy.

Operation:

- Any impacts arising from operation e.g. maintenance of bushfire clearance areas, disturbance.

Rehabilitation:

- Biodiversity offset strategy
- Liaison with rehabilitation consultants regarding appropriate measures to be included.
- Impacts from proposed rehabilitation strategy.

### 6.2.3 Surface Water

The Project Area is situated within the Wolgan River catchment which reports to the Hawkesbury River. As identified from the risk assessment process, there are several potential sources for surface water contamination emanating from the proposed ventilation infrastructure site and the supporting infrastructure footprint during both construction and operation. As such, impacts to be addressed include the following:

- Collection and review of background data;
- Classification and mapping of surface water drainage lines overlying the underground mining area;
- Assessment of impacts to creeks which could be impacted by the proposed Project;
- Review of the existing site water balance which includes analysis of any water quality data to determine the median, 80th and 20th percentile values for each parameter. The background water quality will be compared to the ANZECC water quality guidelines;
- Review and update existing monitoring program as required (including any licensing requirements);
- Determine mitigation or management measures as required; and
- Identify any residual environmental risk.

It is anticipated that the EA will present a full analysis of potential surface water impacts, as well as outline any practical mitigation and management measures required to minimise or mitigate potential impacts.

### 6.2.4 Groundwater

A Groundwater Impact Assessment will be undertaken as part of the EA and will include:

- A review of any available background hydrogeological and mining data;
- Searches of the NSW Groundwater Bore Database to identify beneficial use of groundwater in the anticipated radius of drawdown;
- Consideration of the ecological assessment report (to be prepared concurrently to the groundwater assessment) to identify possible Groundwater Dependant Ecosystems (GDEs);
- Development of a high level, conceptual hydrogeological model, including the identification of model layers and boundaries, material properties and sources / sinks;
- Construction of a MODFLOW hydrogeological model based on the conceptual model with calibration of the model against available underground water level data;
- Predictive simulations of water level change in the workings;
- Development of groundwater management strategies and mitigation measures as required;
- Identification of any residual environmental risk; and
- As part of this process the Groundwater Impact Assessment will consider the implications of the Water Sharing Plan.

### 6.2.5 Greenhouse Gas

This Project will continue to mine the Lithgow seam using which from historic monitoring generally contains low concentrations of GHGs. The GHG assessment will:

- Calculate Scope 1, 2 and 3 greenhouse gas estimations for the on-site activities associated with the Modification in accordance with the requirements of the NGER Act, and by applying all relevant emission factors and methods including those documented in the NGER System Measurement, Technical Guidelines (June 2010);
    - Scope 1 GHG consist of direct emissions from sources within the boundary of an organisation such a vehicle emissions and manufacturing processes;
    - Scope 2 GHG are indirect emissions from the use of purchase electricity and other consumables;
    - Scope 3 includes all other emissions which occur as a consequence of an organisation's activities but are not from sources owned or controlled by the

organisation. A good example in the case of Angus Place is the release of GHG from the combustion of coal used in the generation of electricity.

- Assess the significance of GHG emissions for the Modification in relation to national GHG objectives, and report on the Project's greenhouse gas implications in terms of Federal and NSW Government policies and protocols;
- Determine mitigation or management measures as required; and
- Identify any residual environmental risk.

### 6.2.6 Air Quality

An Air Quality Assessment will be undertaken as part of the EA to assess potential impacts on nearby sensitive receptors. This assessment will include:

- An identification of sensitive receptors within the vicinity of the Project Area.
- Identification of all likely dust generating sources including depositional dust, PM10, and Total Suspended Particulates (TSP);
- Identification of any odour resulting from the proposed activities;
- Establishment of background air quality levels and air quality goals for all relevant air quality emissions in accordance with the NSW DECCW "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales" (2005) and other relevant guidelines;
- Estimation of emission rates, primarily using emission inventory data, including the National Pollutant Inventory (NPI) Emission Estimation Technique Manuals and USEPA AP-42 Emissions Inventory documentation, as required;
- Dispersion modelling to predict PM10, TSP and deposition rates at the closest private receptors;
- Recommendations on mitigation and management strategies; and
- Identification of any residual environmental risk.

### 6.2.7 Noise and Vibration

The Modification has the potential to generate noise and/or vibrations both during the construction and operational phases. As such, a noise impact assessment will be undertaken as part of the EA and will include:

- An identification of sensitive receptors within the vicinity of the Project Area.
- Review of existing background noise levels and contributors from existing infrastructure;

- The assessment will consider noise emissions and vibration levels generated by both the construction and operation of the proposed ventilation shaft;
- Analysis of noise data with reference to local weather conditions and cumulative impacts;
- Impact assessment of the proposed Project's contribution to the noise environment at the nearest sensitive receptors for day, evening and night time periods under calm and prevailing meteorological conditions;
- Identification of noise management strategies and mitigation measures, as required; and
- Identification of any residual environmental risk.

### 6.2.8 Heritage (Aboriginal and European)

An Aboriginal and Non-Aboriginal Impact Assessment will be undertaken as part of the EA and will include:

- Background research, including:
    - Identify statutory requirements relevant to the proposed Project;
    - Consultation with the Aboriginal community and other interested stakeholders in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010);
    - Literature review of previous archaeological studies relevant to the Project Application Area;
    - Search of the Aboriginal Heritage Information Management System (AHIMS) database;
    - Assessment of Aboriginal and European archaeological and cultural heritage items identified within the Project areas;
    - Baseline inventory of all Aboriginal heritage sites inside the Project areas
- Field surveys over the Project areas
- Identification of mitigation and management strategies to avoid and/or minimise against identified Aboriginal and/or European impacts; and
- Identification of any residual environmental risk.

### 6.2.9 Social

A Social Impact Assessment will be undertaken as part of the EA to identify impacts of the proposed Project on the community and recreational users of the Newnes State Forest to identify mitigation and management measures as required.

### 6.2.10 Soils, Land Capability and Agriculture Assessment

The EA will include an assessment and reporting of soils and soil-related issues and recommending further appropriate management and mitigation measures as required. Pending the issue of Agricultural Impact Assessment Guidelines, agricultural impacts will also be considered.

### 6.2.11 Traffic and Transport

A traffic and transport assessment will be carried out and will include:

- Characterisation of the existing road transport environment;
- Identification of potential impacts of the project to the public road network;
- Quantification of traffic generated by the Project during both the construction and operational phases;
- Potential impacts on traffic conditions; and
- Measures to potential impacts from traffic.

### 6.2.12 Economics

An economic assessment will be conducted for the Project. It is anticipated that the scope of the assessment include:

- A cost benefit analysis;
- A regional economic impact assessment of the project;
- Quantification of the economic cost, benefits and impacts of the project; and
- The provision of recommendations on any relevant management and mitigation.

### 6.2.13 Visual

A visual impact assessment will be undertaken as part of the EA.

### 6.2.14 Other

Other assessments will be carried out for the environmental assessment including cumulative impacts, bushfire, hazards and public safety, mine closure and rehabilitation and waste.

# 7.0 STAKEHOLDER AND COMMUNITY CONSULTATION

Centennial will lead the stakeholder and community consultation for the Project. A detailed stakeholder consultation plan will be developed for the Modification, and will provide a framework to identify and appropriately consult with stakeholders that may be influenced by or have an interest in the Project. Key stakeholders include:

- Government (Federal, State and Local);
- Community;
- Local industry;
- Non-government organisations and community bodies; and
- Mine staff and employees.

A stakeholder consultation log will be maintained as a record of the consultation activities undertaken, and the contents of this log will be summarised in the EA.

Consultation to be undertaken as part of the Project will include:

- Letters informing people of the project to all residents surrounding the Project Application Area;
- Updates to the Community Consultative Committee;
- Updates to NGOs such as the Colong Foundation for Wilderness and the Blue Mountains Conservation Society;
- Regular distribution of a newsletter to residents;
- Project updates provided on the Centennial coal website;
- Project updates provided in local print media;
- Media releases;
- Information sessions; and
- Face to face meetings with landowners and other regulatory and industry stakeholders where required or requested.

Angus Place Colliery maintains a community complaints and enquiries telephone line which is available so that members of the community can obtain up to date and factual information or make complaints regarding the Project. The community complaints and enquiries telephone number and an e-mail address are listed in the Angus Place section of the Centennial website so that members of the community are able to make contact with the mine on a 24 hour per day, 7 days per week basis.

# 8.0 CONCLUSION

Centennial Angus Place Pty Ltd (Angus Place Colliery) is seeking approval via Section 75W of Part 3A of the EP&A Act to undertake and continue a range of mining related activities as outlined within this Briefing Paper.

For over 30 years Angus Place Colliery has been:

- mining coal from the Lithgow Seam for its consistent coal characteristics;
- using the same access and egress as that which currently exists; and
- delivering coal to the local power stations (Wallerawang and/or Mount Piper power stations);

To this end, Angus Place considers this proposed modification to be a continuation of existing activities that are currently approved. There will be no changes to the way Angus Place manages coal on the surface, therefore there will be no requirement to change the currently approved pit top surface facilities. These will continue to operate in accordance with the current approval and comply with the current approval conditions.

The proposed modification will result in continued operations to be managed by those pit top facilities currently approved. The mine will continue to operate in compliance with statutory ventilation requirements as required under Clause 13(h) of the NSW Coal Mine Health and Safety Regulation, 2006.

This Briefing Paper has been prepared by Angus Place Colliery to provide a description of the modification and identify likely key social and environmental issues associated with the modification.

It is further anticipated that this Briefing Paper will provide the Department of Planning and Infrastructure with sufficient information regarding the issue of Environmental Assessment Requirements (EARs). Angus Place Colliery is specifically seeking EARs for the assessment of the project specific infrastructure detailed in Section 4 of this Briefing Paper with respect to the existing environment.

## Appendix 1 –Environment and Community Broad Brush Risk Assessment

## Dyadem Stature for Risk Management:

**Risk Assessment Title:** Angus Place Ventilation Facility Project

**Version:** 1

**Region:** West

**Site:** Angus Place

**Department:** ZZZZ Whole Site

**Equipment / Process:** Community

**Stature Risk Assessment No.:** 1000085022

**Study Lifecycle State:** Risk Assessment In Progress

**Potential Hazard No.:**

**PULSE Actions Required URL:**

**Site Risk Assessment Ref. No. (Optional):**

## Background

Angus Place Colliery is situated in the New South Wales western coal field and is managed by Centennial Angus Place Pty Ltd under a joint venture arrangement between Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd. Centennial Angus Place Pty Ltd is 100% owned by Centennial Coal Company Ltd. Centennial Coal Company Ltd is a wholly owned subsidiary of Banpu Public Company Ltd, listed on the Thailand Stock Exchange

Angus Place Colliery commenced production in 1979, after being developed as an extension of the Newcom Mine at Kerosene Vale. Coal is extracted from the Lithgow seam. The principle components of the development are an underground longwall mine and development panels, supporting surface infrastructure (Angus Place pit top), a coal stockpile area (Kerosene Vale) and dedicated haul roads to Delta Electricity's Wallerawang and Mount Piper power stations.

Currently, Angus Place Colliery is gathering additional geological information regarding the north east resource area. Angus Place proposes a Modification Application lodged under Section 75W of Part 3A under the Environmental Planning and Assessment Act 1979; this Modification is known as the Angus Place Ventilation Facility Project.

This Project consists of an application seeking to modify the existing Angus Place Project Approval (PA06_0021) to construct a ventilation/services installation and associated infrastructure on the Newnes State Forest off Sunnyside Ridge Road. First workings are also required from the LW910 install face to the shaft site.

This risk assessment will consider the Angus Place Ventilation Facility Project only.

**Objectives**

The following Hierarchy of Controls offers a framework for considering the effectiveness of controls. Note that the effectiveness of a control that is intended to reduce a risk decreases from top to bottom of the list. In other words, the closer the control type is to the top of the hierarchy, the more potentially effective the control.

·Eliminate the hazard or energy source (do not use the energy)

·Minimise or replace the hazard or energy source (reduce the amount of energy to a less damaging level or replace the energy with another that has less potential negative consequences)

·Control the hazard or energy using engineered devices (ex. Lock outs, chemical containers, mechanical roof support, gas monitors, etc.)

·Control the hazard or energy by using physical barriers (ex. machine guarding, warning signs, etc.)

·Control the hazard or energy with procedures (ex. Isolation procedures, standard operating procedures, etc.)

·Control the hazard or energy with personal protective equipment (ex. hard hats, boots with toe caps, gloves, safety glasses, welding gear, etc.)

·Control the hazard or energy with warnings and awareness (ex. posters, labels, stickers, verbal warnings, etc.)

The objectives of this Risk Assessment are to identify the environment and community risks associated with the proposed Angus Place Ventilation Facility Project and to identify knowledge gaps where further information and/or assessment will be required to support an Environmental Assessment for the proposed Project.

**Potential Hazards**

The potential hazards for the proposed Angus Place Mine Extension Project include:

- Impact to Flora / Fauna

- Minor subsidence impacts from first workings;

- Impact to groundwater aquifers;

- Surface runoff and sedimentation issues;

- Traffic Impacts;

- Noise Impacts;

- Impacts to air quality (dust/odour);

- Impacts from GHG emissions;

- Visual impacts

- Impact to Aboriginal / Cultural Heritage

- Impact to European Heritage

- Community impacts

- Bushfire impacts

- Public safety

- Rehabilitation

- Water resources

- Soil and land

- Waste

- Aquatic impacts

- Cumulative impacts

- Odour

- Mine Closure

**Boundary Definition**

This is a preliminary Environment and Community Risk Assessment aimed to identify knowledge gaps and areas where further assessments will be required. The full extent of environmental risks associated with this Project will not be understood until further and more detailed investigations have been undertaken. This risk assessment should be reviewed following the completion of the detailed investigations to ensure all environmental risks associated with the Project have been identified, understood and are at an acceptable level for the Company.

## Methods

| Yes/No | Method |
|---|---|
| Yes | Workplace Risk Assessment and Control (WRAC) |
| No | Fault Tree Analysis (FTA) |
| No | Safety Integrity Level Analysis to Australian Standard 61508 (SIL) |
| No | Bow Tie Analysis (BTA) |
| No | Failure Modes and Effects Analysis (FMEA) |
| No | Hazard and Operability Analysis (HAZOP) |

## Previous Risk Assessment and other Documents to be used and/or Referenced

| Document Name | Title | Version | Referenced Document Date |
|---|---|---|---|
| RA0515 | Angus Place Life of Asset Concept Risk Assessment | | |
| | Angus Place Ventilation Facility Project Description | | |
| RA0560 | Angus Place Mine Extension Project Risk Assessment | | |

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## Venue and Time

| Date | Description | Location | Start Time | End Time | Comment |
|---|---|---|---|---|---|
| 1. 5 May 2011 | Scoping | Angus Place Small Conference Room | 4:00 PM | 4:30 PM | |
| 2. 5 May 2011 | Assessment | Angus Place Small Conference Room | 4:30 AM | 5:00 PM | |
| 3. | | | | | |
| 4. | Review | | | | |

## Team Selection

| Name | Title | Company | Industry Start Date | Yrs. of Exp. | Mobile Phone # | E-Mail Address | Pulse User No. | Role | Attendance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1. | 2. | 3. | 4. |
| Iain Hornshaw | Environmental Coordinator | Angus Place Colliery | 20-Aug-2007 | 4 | | iain.hornshaw@centennialcoal.com.au | 10991 | Risk Assessment Owner | | | | |
| Edwina White | Regional Environmental Manager | Western Region | 15-Dec-1995 | 15 | | edwina.white@centennialcoal.com.au | 101028 | Administrative Assistant | | | | |
| Natalie Conroy | Environmental Officer | Western Region | 31-Jan-2011 | 0 | | natalie.conroy@centennialcoal.com.au | | Administrative Assistant | | | | |
| Katherine Hayward | Principal Environmental Planner | RPS | 08-Apr-2002 | 9 | | katherine.hayward@rpsgroup.com.au | | | | | | |
| Tim Moore | Technical Director | RPS | 04-Jul-1994 | 17 | | | | | | | | |

## Scope Confirmation

| Approver | Scope Confirmation | Date | Comments |
|---|---|---|---|
| 1. Jacques Le Roux | Yes | May 05, 2011 | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| 1. Mining | There is a risk to Angus Place from<br><br>::: Subsidence :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in:<br><br>Impact to heritage sites. | 1.1.a. Consultation with the aboriginal community has been undertaken in accordance with Interim Community Consultation Requirements for Applicants | **C**<br><br>(Pb) | 3<br><br>(L) | **13**<br><br>**(S)** | 1. Subsidence predictions and impact assessment (cumulative impacts) | |
| | | 1.1.b. SRK geotechnical hazard map | | | | 2. Groundwater assessment (include a review and consider implications to the Water Sharing Plan) | |
| | | 1.1.c. Surface topographic mapping indicates known cliff lines | | | | 3. European heritage assessment across Project Area | |
| | | 1.1.d. Approved and implemented subsidence management plan | | | | 108. Stakeholder consultation in accordance with the Aboriginal cultural heritage consultation requirements to proponents (2010 guidelines) | |
| | | 1.1.e. Limited listed European Heritage sites within lease area | | | | 93. Archaeological assessment | |
| | | 1.1.f. No listed European Heritage sites within proposed mining area | | | | | |
| | There is a risk to Angus Place from<br><br>::: Subsidence :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in: | 1.2.a. Known listed communities (NPSS and NPHS) have been mapped by OEH | **C**<br><br>(Pb) | 3<br><br>(L) | **13**<br><br>**(S)** | 1. Subsidence predictions and impact assessment (cumulative impacts) | |
| | | 1.2.b. Approved and implemented Subsidence Management Plan for the current SMP Application area | | | | 5. Ecological impact assessment | |
| | | 1.2.c. Detailed surface water monitoring programme in place | | | | 6. Groundwater assessment | |
| | | 1.2.d. Surface to seam groundwater piezometers installed in north east area | | | | 7. Implementation of stakeholder engagement plan | |
| | | 1.2.e. SRK geotechnical hazard map | | | | 94. Map surface geological structures and compare to known underground geology | |
| | | 1.2.f. Flora and Fauna Management Plan | | | | | |
| | | 1.2.g. Significant existing data from SMP fauna monitoring program | | | | | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Impact to flora/fauna or ecological communities. | | | | | | |
| | There is a risk to Angus Place from<br><br>::: Subsidence :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in:<br><br>Impact to river/creek geomorphology or sedimentation/erosion impacts. | 1.3.a. Mapping of known water courses and 1st, 2nd, 3rd order streams across project area<br>1.3.b. Angus Place has an existing site water management plan<br>1.3.c. Approved and implemented subsidence management plan<br>1.3.d. Detailed surface water monitoring programme in place<br>1.3.e. SRK geotechnical hazard map | **D**<br>(IF) | 5<br>(E) | **24**<br>**(L)** | 8. Surface water impact assessment (quality and volumetric)<br>1. Subsidence predictions and impact assessment (cumulative impacts)<br>9. Implementation of Stakeholder Engagement Plan | |
| | There is a risk to Angus Place from<br><br>::: Subsidence :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in: | 1.4.a. Approval of mine design required for secondary extraction through an SMP or extraction plan<br>1.4.b. Location of significant infrastructure known<br>1.4.c. Subsidence Community Consultation Program<br>1.4.d. SRK geotechnical hazard map<br>1.4.e. Approved and implemented subsidence management plan<br>1.4.f. Existing mapped infrastructure (forest tracks, mining infrastructure) | **D**<br>(Pb) | 3<br>(BI) | **17**<br>**(M)** | 11. Comprehensive land search - Dept of Lands.<br>109. Dial before you dig<br>9. Implementation of Stakeholder Engagement Plan<br>17. Review of subsidence predictions regarding existing infrastructure<br>18. Review of subsidence predictions regarding proposed location of infrastructure<br>1. Subsidence predictions and impact assessment (cumulative impacts) | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Impacts to surface infrastructure. | | | | | | |
| | There is a risk to Angus Place from<br><br>::: Subsidence :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in:<br><br>Impacts to soil, land and agriculture. | 1.5.a. SRK geotechnical hazard map | **D**<br><br>(Pb) | 4<br><br>(E) | **21**<br><br>**(L)** | 19. Soil and land capability assessment (include steep slopes and agricultural impacts) | |
| | | 1.5.b. Surface topographic mapping | | | | 20. Review with respect to surface water impact assessment | |
| | There is a risk to Angus Place from<br><br>::: Depressurisation of groundwater aquifers :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in: | 1.6.a. Monitoring bores have been installed in some parts of the project area | **A**<br><br>(D) | 4<br><br>(E) | **10**<br><br>**(S)** | 15. Ecological assessment (search for and assess impacts to GDEs) | |
| | | 1.6.b. Limited number of groundwater users around the project area | | | | 1. Subsidence predictions and impact assessment (cumulative impacts) | |
| | | 1.6.c. Known extraction rates at bore 940 and pit top groundwater collection system | | | | 2. Groundwater assessment (include a review and consider implications to the Water Sharing Plan) | |
| | | 1.6.d. Angus Place East multilevel piezometers | | | | 16. Review of existing water balance | |
| | | 1.6.e. Angus Place has an existing stakeholder engagement plan | | | | 7. Implementation of stakeholder engagement plan | |
| | | 1.6.f. Mine water balance has been prepared for Angus Place Colliery | | | | | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Impacts to groundwater dependent ecosystems and/or groundwater users or Mine dewatering activities. | | | | | | |
| | There is a risk to Angus Place from<br><br>::: Release of GHG emissions :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings)<br><br>Resulting in:<br><br>Scope 1 greenhouse gas contributions to the atmosphere via the fan shaft or Scope 2 greenhouse emissions from power consumption or Scope 3 greenhouse emissions - coal sales. | 1.7.a. Annual NGERS reporting undertaken<br>1.7.b. Monitoring and reporting of electricity and diesel usage<br>1.7.c. Low in-seam gas content<br>1.7.d. Gas monitoring (tube bundle system) | **A**<br>(D) | 4<br>(BI) | **10**<br>**(S)** | 12. Greenhouse assessment (Scopes 1, 2 and 3) | |
| | There is a risk to Angus Place from<br><br>::: Extension of mining operations :::<br><br>Caused by:<br><br>Mining using continuous miner method (first workings) | 1.8.a. Social impact assessment completed for the current Angus Place Colliery<br>1.8.b. Angus Place Colliery community consultative committee | **A**<br>(Pj) | 4<br>(R) | **10**<br>**(S)** | 13. Social impact assessment<br>14. Implementation of Stakeholder Engagement Plan | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Resulting in:<br><br>Community/public angst and/or adverse media coverage or Cumulative impacts with regional infrastructure and operations. | | | | | | |
| 2. Construction | There is a risk to Angus Place from<br><br>::: Construction of additional ventilation facility and site services :::<br><br>Caused by:<br><br>Requirement of the Project<br><br>Resulting in:<br><br>Bushfire impacts or Community/public angst and/or adverse media coverage or Cumulative impacts with regional infrastructure and operations or Exceedances of Project specific noise criteria or local complaints or Groundwater (hydrogeological impacts) or Hazardous goods storage or Impacts to aboriginal heritage sites or Impacts to air quality or Impacts to European heritage sites or Impacts to flora/fauna and/or ecological | 2.1.a. Social impact assessment completed for the current Angus Place Colliery | **A**<br><br>(Pj) | 2<br><br>(E) | **3**<br><br>**(E)** | 21. Implementation of the Stakeholder Engagement Plan | |
| | | 2.1.b. Angus Place Colliery community consultative committee | | | | 13. Social impact assessment | |
| | | 2.1.c. Angus Place has an existing stakeholder engagement plan | | | | 22. Noise and vibration impact assessment (construction and operational phase) | |
| | | | | | | 10. Groundwater assessment | |
| | | | | | | 31. Ecological assessment (consideration of weeds and offset strategy) | |
| | | | | | | 3. European heritage assessment across Project Area | |
| | | | | | | 4. Stakeholder consultation in accordance with the 2001 Guidelines | |
| | | | | | | 23. Public safety to be addressed in the EA | |
| | | | | | | 24. Economic assessment to consider clearing activities (loss of vegetation value) | |
| | | | | | | 25. Soil and land capability assessment (spill management & sump. Potential fill import or agricultural suitability) | |
| | | | | | | 26. Surface water impact assessment (sediment/erosion controls) | |
| | | | | | | 27. Visual impact assessment | |
| | | | | | | 28. Traffic impact assessment (existing road infrastructure assessment & cumulative impacts. Safety of other road users) | |
| | | | | | | 29. Waste management assessment (minimising and management. Location of waste collection deposits) | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | communities or Impacts to land value (economic) or Impacts to soil/land or Impacts to surface water or Impacts to visual amenity or Public safety or Traffic impacts or Waste (cuttings). | | | | | 30. Review of waste streams from engineers<br>32. Cumulative impacts (noise etc.)<br>33. Public safety to be addressed in EA<br>34. Hazardous goods assessment to be considered within the EA<br>35. Bushfire impact assessment (to consider sources & safety)<br>37. Greenhouse assessment (scope 1 only)<br>101. Greenhouse gas assessment | |
| | There is a risk to Angus Place from<br><br>::: Construction of supporting surface infrastructure (powerlines, pipelines substation etc.) on Newnes State Forest :::<br><br>Caused by:<br><br>Requirement of the Project<br><br>Resulting in:<br><br>Community/public angst and/or adverse media coverage or Cumulative impacts with regional infrastructure and operations or Exceedances of Project specific noise criteria or local complaints or Impact to flora/fauna or ecological communities or Impacts to aboriginal heritage sites or Impacts to air quality or Impacts to | 2.2.a. Social impact assessment completed or the current Angus Place Colliery<br>2.2.b. Angus Place Colliery community consultative committee<br>2.2.c. Angus Place has an existing stakeholder engagement plan | **A**<br>(Pj) | 2<br>(E) | **3**<br>**(E)** | 36. Surface water impact assessment (water supply during construction - licensing requirements. Review of requirements under the Water Sharing Plan)<br>34. Hazardous goods assessment to be considered within the EA<br>37. Greenhouse assessment (scope 1 only)<br>32. Cumulative impacts (noise etc.)<br>33. Public safety to be addressed in EA<br>35. Bushfire impact assessment (to consider sources & safety)<br>68. Social impact assessment<br>69. Noise and vibration impact assessment<br>70. Groundwater assessment<br>71. Ecological assessment (consideration of weeds, value of timber to Forests NSW and offset strategy)<br>72. European heritage assessment across Project Area<br>73. Stakeholder consultation in accordance with the Aboriginal cultural heritage consultation requirements to proponents (2010 guidelines)<br>96. Archaeological assessment<br>74. Public safety to be addressed in the EA<br>75. Economic assessment to consider clearing activities (loss of vegetation value)<br>76. Soil and land capability assessment (spill management | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | European heritage sites or Impacts to flora/fauna and/or ecological communities or Impacts to land value (economic) or Impacts to soil/land or Impacts to surface infrastructure or Impacts to visual amenity or Public safety or Sedimentation and/or erosion. Impact to surrounding bushland or Traffic impacts or Waste (cuttings). | | | | | & sump. Potential fill import or agricultural suitability)<br>77. Surface water impact assessment (sediment/erosion controls)<br>78. Visual impact assessment<br>79. Traffic impact assessment (existing road infrastructure assessment & cumulative impacts. Safety of other road users)<br>80. Waste management assessment (minimising and management. Location of waste collection deposits)<br>81. Review of waste streams from engineers | |
| | There is a risk to Angus Place from<br><br>::: Construction of pipeline from LDP001 to SDWTS :::<br><br>Caused by:<br><br>EPL 467 requirement (PRP)<br><br>Resulting in:<br><br>Community/public angst and/or adverse media coverage or Exceedances of Project specific noise criteria or local complaints or Impact to flora/fauna or ecological communities or Impact to heritage sites or Impact to receiving catchment or Impact to river/creek geomorphology or sedimentation/erosion impacts or Impacts to aboriginal heritage sites or Impacts to European heritage sites or | 2.3.a. Social impact assessment completed for the current Angus Place Colliery<br>2.3.b. Angus Place Colliery community consultative committee<br>2.3.c. Angus Place has an existing stakeholder engagement plan | **A**<br><br>(Pj) | 4<br><br>(R) | **10**<br><br>**(S)** | 7. Implementation of stakeholder engagement plan<br>13. Social impact assessment<br>38. Land ownership investigation (consider surrounding land use, agricultural suitability and land capability)<br>39. Traffic impact assessment (consider haulage activities)<br>40. Dial before you dig<br>41. Review of private infrastructure<br>90. Surface water impact assessment<br>92. Groundwater assessment<br>91. Heritage assessment<br>97. Noise assessment during construction<br>95. Ecological assessment<br>44. Air quality impact assessment (dust )<br>101. Greenhouse gas assessment<br>102. Soil and land assessment | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Impacts to surface infrastructure or Impacts to visual amenity or Traffic impacts. | | | | | | |
| 3. Operation of facilities and/or equipment | There is a risk to Angus Place from<br><br>::: Operation of additional ventilation facility and site services :::<br><br>Caused by:<br><br>Requirement of the Project<br><br>Resulting in:<br><br>Bushfire impacts or Community/public angst and/or adverse media coverage or Cumulative impacts with regional infrastructure and operations or Disturbed untrafficked areas or Exceedances of air quality criteria at nearby receptors or local complaints or Exceedances of Project specific noise criteria or local complaints or Greenhouse gas contributions to the atmosphere via the fan shaft or Hazardous goods storage or Impacts to visual amenity or Public safety or Traffic impacts. | | **A**<br>(Pj) | 4<br>(R) | **10**<br>**(S)** | 42. Social impact assessment<br>23. Public safety to be addressed in the EA<br>43. Implementation of Stakeholder Engagement Plan<br>44. Air quality impact assessment (dust )<br>45. Noise and vibration impact assessment<br>46. Greenhouse assessment (scope 1 and 2)<br>47. Hazardous goods to be considered within the EA<br>48. Surface water impact assessment (clean and dirty water system. Wash down activities)<br>49. Visual impact assessment<br>50. Traffic impact assessment (concrete trucks, fuel trucks, ballast trucks, maintenance)<br>51. Rehabilitation plan (consider handling of soil and cuttings. Weed management)<br>52. Assessment of cumulative impacts in the EA<br>53. Bushfire impact assessment (to consider sources and safety)<br>98. Consider impact on mining conditions (if not approved)<br>103. Ecological assessment (disturbance)<br>105. Soil and land assessment (pollution prevention)<br>104. Groundwater assessment (maintenance) | |
| | There is a risk to Angus Place from | | **A**<br>(Pj) | 4<br>(R) | **10**<br>**(S)** | 82. Bushfire impact assessment (to consider sources and safety)<br>99. Ecological impact assessment (will the infrastructure fragment the vegetation communities? will it cause a barrier for mammals and birds?) | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | ::: Operation of supporting surface infrastructure (powerlines, pipelines, substation etc.) on Newnes State Forest :::<br><br>Caused by:<br><br>Requirement of the Project<br><br>Resulting in:<br><br>Bushfire impacts or Community/public angst and/or adverse media coverage or Cumulative impacts with regional infrastructure and operations or Impact to flora/fauna or ecological communities or Impact to heritage sites or Impacts to surface infrastructure or Impacts to visual amenity or Traffic impacts. | | | | | 83. Assessment of cumulative impacts in the EA<br>84. Rehabilitation plan (consider handling of soil and cuttings. Weed management)<br>85. Visual impact assessment<br>86. Surface water impact assessment (clean and dirty water system. Wash down activities)<br>87. Hazardous goods to be considered within the EA<br>88. Air quality impact assessment (dust and odour)<br>89. Public safety to be addressed in the EA (consider maintenance programs)<br>106. Ecological assessment (maintenance of bushfire buffer areas)<br>107. Soil and land assessment | |
| | There is a risk to Angus Place from<br><br>::: Operation of the pipeline from LDP001 to SDWTS :::<br><br>Caused by:<br><br>EPL 467 requirement (PRP) | 3.3.a. Angus Place Colliery Community Consultative Committee<br>3.3.b. Mapping sensitive surface features<br>3.3.c. Site water management plan<br>3.3.d. ANZECC monitoring<br>3.3.e. Aquatic monitoring | **A**<br>(D) | 4<br>(R) | **10**<br>**(S)** | 54. Aquatic impact assessment (will changes to water quality from removal of LDP001 affect aquatic life))<br>55. Surface water impact assessment (removal of LDP001 discharge and consideration of LDP002/LDP003)<br>56. Social impact assessment (water users)<br>57. Ecological assessment<br>58. Assessment of cumulative impacts<br>59. Implementation of stakeholder engagement plan<br>60. Energy and greenhouse assessment | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Resulting in:<br><br>Community/public angst and/or adverse media coverage or Greenhouse gas contribution or Impact to flora/fauna or ecological communities or Impact to receiving catchment. | | | | | | |
| 4. Water management | There is a risk to Angus Place from<br><br>::: Exceedances of EPL volumetric limits :::<br><br>Caused by:<br><br>Potential increase in mine water discharge requirements resulting from first workings extraction<br><br>Resulting in:<br><br>Community complaints and/or EPL non-compliance. | 4.1.a. Angus Place has an existing site water management plan<br>4.1.b. Mine water balance has been prepared for Angus Place Colliery<br>4.1.c. Angus Place East multilevel piezometers | **A**<br>(D) | 5<br>(E) | **15**<br>**(S)** | 61. Groundwater assessment (including a review of mine water make)<br>62. Review existing water balance<br>63. Surface water impact assessment | |
| | There is a risk to Angus Place from<br><br>::: Exceedance of EPL and/or ANZECC water quality criteria ::: | 4.2.a. Approved and implemented site water management plan<br>4.2.b. Pollution control infrastructure | **A**<br>(D) | 5<br>(E) | **15**<br>**(S)** | 62. Review existing water balance<br>63. Surface water impact assessment<br>61. Groundwater assessment (including a review of mine water make) | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | Caused by:<br><br>Potential increase in mine water discharge requirements resulting from first workings extraction<br><br>Resulting in:<br><br>Community complaints and/or EPL non-compliance. | | | | | | |
| 5. Rehabilitation | There is a risk to Angus Place from<br><br>::: Rehabilitation of infrastructure :::<br><br>Caused by:<br><br>No longer required by the Project<br><br>Resulting in:<br><br>Cumulative impacts with regional infrastructure and operations or Impact to flora/fauna or ecological communities. Or Impacts to visual amenity or Public angst if not properly managed. | 5.1.a. Flora and Fauna surveys have been conducted over sections of proposed mining area<br>5.1.b. Mapping sensitive surface features<br>5.1.c. Angus Place Colliery Community Consultative Committee | **C**<br>(IF) | 3<br>(E) | **13**<br>**(S)** | 64. Rehabilitation assessment and conceptual plan for Project Area (asses the performance of previous rehabilitation activities within Newnes State Forest, consider mine closure of these facilities at a high level)<br>65. Implementation of stakeholder engagement plan | |
| 6. Project Assessment | There is a risk to Angus Place from | 6.1.a. Project preparation | **C** | 1 | **5** | 66. Prepare adequate environmental assessment | |

| Step | Potential Incident | Current Controls | L | MRC | RR | Recommended Control | Bow Tie Extension |
|---|---|---|---|---|---|---|---|
| | ::: No approval :::<br><br>Caused by:<br><br>Inadequate Environmental Assessment<br><br>Resulting in:<br><br>Economic loss to local/regional area or Loss of jobs or Project refusal or Reduction in NSW revenue contributions. | 6.1.b. Environment and community project risk assessment<br>6.1.c. Baseline monitoring | (Pb) | (BI) | **(H)** | 67. Prepare social impact assessment and economic assessment<br>100. Implement stakeholder engagement plan | |

**RISK MANAGEMENT STANDARD** **Management Standard-004**

## CENTENNIAL RISK MATRIX

| Rating | Consequence<br>Note: Consequence may result from a single event or may represent a cumulative impact over a period of 12 months. Use the worst case reasonable consequence if there is more than one. | | | | | | Likelihood<br>A Certain | B Probable | C Possible | D Remote | E Improbable | Description (D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Impact to Annual Business Plan (F) | Personal Injury (PI) | Business Interruption (BI) | Legal (L) | Reputation (R) | Environment (E) | Common" | Has Happened within Centennial" | "Could Happen & has happened in non-CEY operations | Not Likely | "Practically impossible | Probability (Pb) |
| | | | | | | | Frequent incidents | Regular incidents | Infrequent incidents | Unlikely to occur. Very few recorded or known incidents | May occur in exceptional circumstances. Almost no recorded incidents. | Incident Frequency (IF) |
| | | | | | | | Operations – within 3 months | Operations – within 2 years | Operations – within 5 years | Operations – within 10 years | Operations – within 30 years | Operations (Op) |
| | | | | | | | Project – Every project | Project – Every 2 projects | Project – Every 5 projects | Project – Every 10 projects | Project – Every 30 projects | Project (Pr) |
| **1. Catastrophic** | >$50m | Multiple Fatalities | > 1month | Prolonged litigation, heavy fines, potential jail term | Prolonged International media attention | Long term impairment habitats/ ecosystem | 1 (E) | 2 (E) | 5 (H) | 7 (H) | 11 (S) | |
| **2. Major** | $10m - $50m | Single Fatality | 1 week to 1 month | Major breach/ major litigation | International media attention | Long term effects of ecosystem | 3 (E) | 4 (E) | 8 (H) | 12 (S) | 16 (M) | |
| **3. Moderate** | $1m - $10m | Serious/ Disabling Injury | 1 day to 1 week | Serious breach of regulation. prosecution/ fine | National media attention | Serious medium term environmental effects | 6 (H) | 9 (H) | 13 (S) | 17 (M) | 20 (L) | |
| **4. Minor** | $100k - $1m | Lost Time Injury | 12 hrs to 1 day | Non-compliance, breaches in regulation | Adverse local public attention | Minor effects to physical environment | 10 (S) | 14 (S) | 18 (M) | 21 (L) | 23 (L) | |
| **5. Insignificant** | <$100k | First Aid Treatment Only | < 12 hrs | Low level compliance issue | Local complaints | Limited physical damage | 15 (S) | 19 (M) | 22 (L) | 24 (L) | 25 (L) | |

| Risk Rating | Risk Category | | Generic Management Actions |
|---|---|---|---|
| 1 to 4 | E | Extreme | Immediate intervention required from senior management to eliminate or reduce this risk |
| 5 to 9 | H | High | Imperative to eliminate or reduce risk to a lower level by the introduction of control measures. Management planning required at senior levels |
| 10 to 15 | S | Significant | Corrective action required, senior management attention needed to eliminate or reduce risk |
| 16 to 19 | M | Moderate | Corrective action to be determined, management responsibility must be specified |
| 20 to 25 | L | Low | Monitor and manage by corrective action where practicable |

| BOW TIE ANALYSIS - Control Effectiveness Matrix | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Examples** | **Description** | **Rank** | **Control Category** | **CONTROL – Impact / Status / Quality** | | | | |
| | | | | | **A** >= 80% | **B** 50 – 80% | **C** 50 / 50% | **D** 50 – 20% | **E** <= 20% |
| **TYPE OF CONTROL** | Replace electric hand tools with compressed air alternatives in wet conditions | Eliminates a hazard by removal | **1.** | **Elimination of hazard** | | | | | |
| | Replace large diameter, heavy cables with smaller ones that are easier to handle manually | Replace element with less risky alternative | **2.** | **Substitution** | | | | | |
| | Automatic fire fighting sprinkler systems | An automatic device that operates without intervention by personnel | **3.** | **Engineered without people** | | | | | |
| | Fire alarm that sounds & the operator then has to initiate an evacuation | A device that requires personnel to respond to a stimulus | **4.** | **Engineered with people** | | | | | |
| | Inspection, maintenance and repair of machinery | A process carried out by personnel | **5.** | **Procedural** | | | | | |
| | Employee made aware of dangers of large moving equipment where the operators have limited vision | Induction training programs | **6.** | **Awareness** | | | | | |