



# **WYONG AREAS COAL JOINT VENTURE**

## **Background Document**

OCTOBER 2011



# **WALLARAH 2 COAL PROJECT**

## **BACKGROUND DOCUMENT**

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## WALLARRAH 2 COAL PROJECT BACKGROUND DOCUMENT

### *for* **Wyong Areas Coal Joint Venture**

## 1 INTRODUCTION

### 1.1 BACKGROUND

Wyong Areas Coal Joint Venture (WACJV) was granted Exploration Licence (EL) 4911, EL 5903, EL4 912 and Authorisation (A) 405 (the WACJV Mining Authorities) in 1995. The WACJV has since conducted extensive exploration and environmental studies and a pre-feasibility study into the development of an underground coal mine within the Mining Authorities.

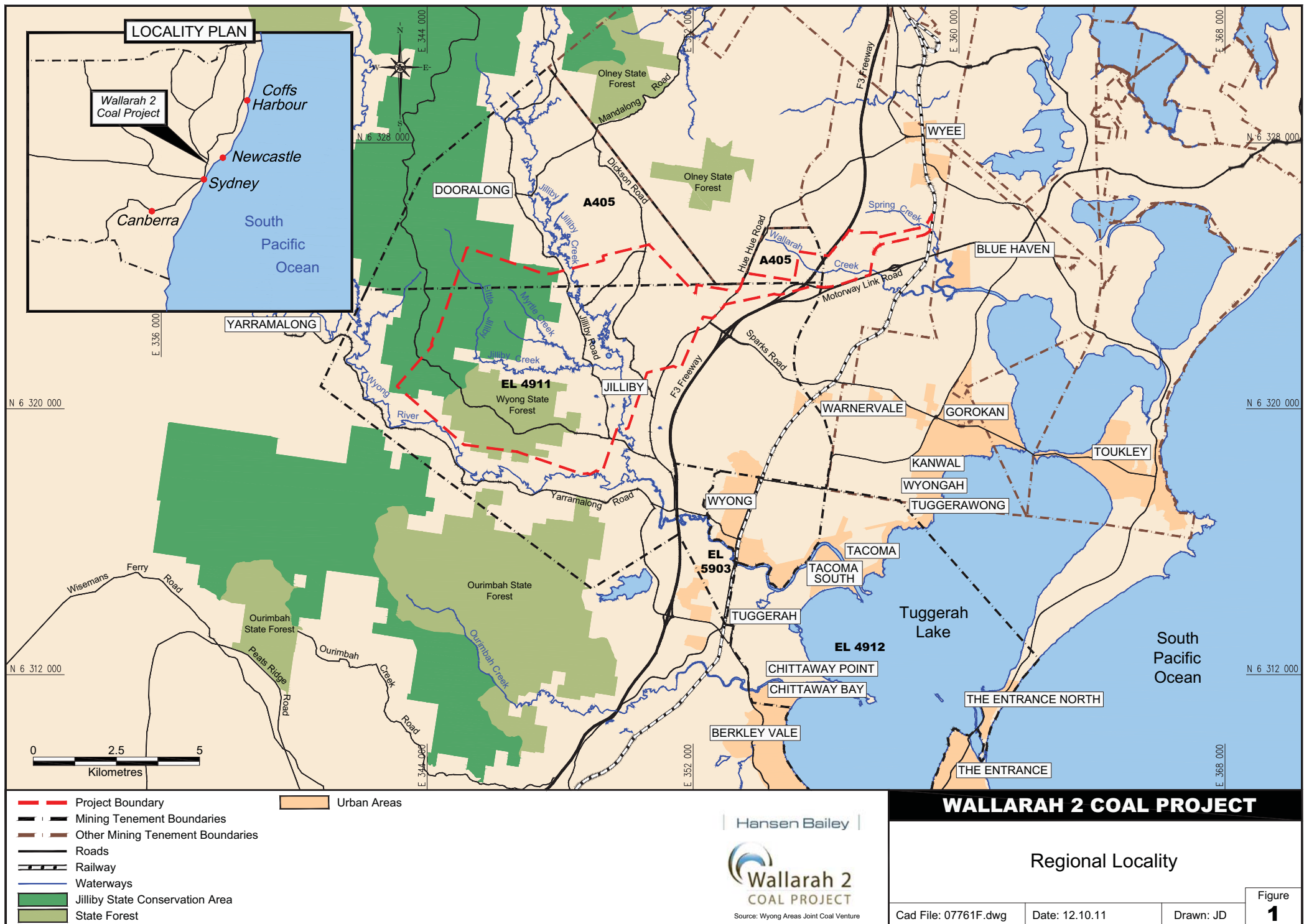
The Project is located approximately 4.7 km north-west of central Wyong and approximately 45 km south-west of Newcastle within the Wyong Local Government Area (LGA). **Figure 1** illustrates the regional locality of the Project in relation to the nearest town centres.

The WACJV previously sought Project Approval for the Wallarrah 2 Coal Project (W2CP) under the recently repealed Part 3A of the *Environmental Planning & Assessment Act 1979* (EP&A Act). This application was supported by the “*Wallarrah 2 Coal Project Environmental Assessment*” (International Environmental Consultants, February 2010) (W2CP EA) and was refused by the (then) Minister for Planning (the Minister), the Honourable Tony Kelly on 3 March 2011.

The Minister’s refusal cited specific issues that required further information to improve the certainty of impact assessment conclusions which included additional:

- Subsidence prediction modelling, specifically for the western area;
- Heritage and ecological assessment, particularly in the western areas that are subject to the additional subsidence modelling; and
- Details of site water management and water balance at the surface facilities sites (particularly the Tooheys Road Site).

Additional survey, modelling and assessment work to address these issues have commenced and will be included in future detailed environmental impact assessment documentation as described in **Section 8** of this Background Document.



## 1.2 PROJECT OVERVIEW

The WACJV now seeks a Development Consent under Division 4.1 in Part 4 of the EP&A Act for the Project. This Background Document supports the WACJV's request for the Director-General's environmental impact assessment requirements (DGRs) for the Project in accordance with the requirements in Part 2 in Schedule 2 to the *Environmental Planning & Assessment Regulation 2000* (EP&A Regs). The Wallarah 2 Coal Project Environmental Impact Statement (Wallarah 2 EIS) is being prepared by Hansen Bailey Environmental Consultants to support the application.

WACJV proposes to extract approximately 150 million tonnes (Mt) of coal from within the proposed 42 year total Extraction Area. The majority of this resource will be extracted within this Development Consent which is sought for a period of 28 years. A Development Consent would be needed and sought for extracting the remainder of the coal resource. The majority of this resource lies beneath the Wyong State Forest and surrounding ranges (including the Jilliby State Conservation Area (SCA)) while a proportion, to be extracted first, lies beneath a section of the Dooralong Valley and the Hue Hue area.

Key features of the Project include:

- The construction and operation of an underground mining operation extracting up to 5.0 Mtpa of export quality thermal coal by longwall methods at a depth of between 350 m and 690 m below the surface within the underground Extraction Area;
- Mining and related activities will occur 24 hours a day 7 days a week for a Project period of 28 years;
- Tooheys Road Site surface facilities on company owned and third party land (potentially leasehold land) between the Motorway Link Road and the F3 Freeway which will include (at least) a rail loop and spur, stockpiles, water and gas management facilities, workshop and offices;
- Buttonderry Site Surface Facilities on company owned land at Hue Hue Road between Sparks Road and the Wyong Shire Council's (WSC) Buttonderry Waste Management Facility. This facility will include (at least) the main personnel access to the mine, main ventilation facilities, offices and employee amenities;
- An inclined tunnel (or "drift") constructed from the coal seam beneath the Buttonderry Site to the surface at the Tooheys Road Site;
- The ability to receive, stockpile and rail coal from other sources at the Tooheys Road Site within the approval limits sought. This capability could result in a reduction in overall road haulage of coal between the Central Coast and the Newcastle region;
- Potential land subdivision to allow a lease over a rail spur easement at the Tooheys Road Site;

- Construction and use of various mining related infrastructure including water management structures, water treatment plant (reverse osmosis or similar), generator, second air intake ventilation shaft, boreholes, communications, water discharge point, powerlines, and easements to facilitate connection to the WSC (after July 2013, the Central Coast Water Corporation) water and sewerage connections in future;
- Capture of methane for treatment initially involving flaring as practicable for greenhouse emission management and ultimately for beneficial use of methane such as electricity generation at the Tooheys Road Site;
- Transport of coal by rail to either the Newcastle port for export or to domestic power stations;
- A workforce of approximately 300 full-time equivalent employees; and
- Rehabilitation and closure of the site at cessation of mining operations.

The land which is the subject of the Project Development Application comprises the area within the Project Boundary on **Figure 1** and excludes the surface (defined as lands to a depth of 50 m from the surface) of the Jilliby SCA (shown in green). Exclusion of the surface of these lands however does not preclude these areas below 50 m from the surface being used for purposes associated with the underground mining project. It also does not preclude the Project's use of existing roads and surface land access for a variety of purposes in this area (such as for monitoring, exploration and other surface activities) to be outlined in the Wallarrah 2 EIS and likely to be necessary to meet the conditions of the Development Consent.

It is noted that land which will be subject to surface disturbance is largely owned by WACJV. A section of the proposed rail spur will traverse through land owned by Darkinjung Local Aboriginal Land Council (DLALC) and also a Crown land property, while a relatively small area for the future western shaft is owned by State Forests. The Project description is discussed in **Section 3**.

### 1.3 PROPONENT

The proponent is the WACJV whose majority partner is Kores Australia Pty Ltd (Kores). The current ownership structure of WACJV is:

- |                                    |        |
|------------------------------------|--------|
| • Kores Australia Pty Ltd          | 82.25% |
| • Catherine Hill Resources Pty Ltd | 5.00%  |
| • Kyungdong Australia Pty Ltd      | 4.25%  |
| • SK Australia (Wyong) Pty Ltd     | 4.25%  |
| • SK Networks Resources Pty Ltd    | 4.25%  |

The contact details for WACJV are:

**Wyong Areas Coal Joint Venture**  
25 Bryant Drive  
PO Box 3039  
TUGGERAH NSW 2259  
Phone: 02 4352 7500  
[www.wallarrah.com.au](http://www.wallarrah.com.au)

## 1.4 DOCUMENT STRUCTURE

This Background Document is structured as follows:

- **Section 2** provides an overview of the existing environment;
- **Section 3** provides a detailed description of the Project;
- **Section 4** identifies the regulatory framework relevant to the Project;
- **Section 5** describes the stakeholder engagement program conducted to date and to be undertaken to ensure all stakeholders continue to be consulted regarding the Project;
- **Section 6** provides an overview of the previous environmental assessments conducted for the Project and summarises residual matters in relation to the assessment of the Project;
- **Section 7** summarises a contemporary environmental risk assessment conducted for the Project which considers all stakeholder and regulatory engagement since the W2CP EA and is provided in full in **Appendix A**;
- **Section 8** describes the potential environmental and social impacts and proposed assessment methodology for all key environmental issues identified from previous environmental assessments;
- **Section 9** provides a preliminary justification for the Project; and
- **Section 10** lists abbreviations used in this document and **Section 11** shows all relevant references.

This Background Document has been prepared in accordance with the “Supporting Document” requirements outlined in Section 8 of the form to be used to request DGRs for State Significant Development (SSD).

**Table 1** lists these requirements and where each is addressed in the Background Document.

**Table 1**  
**Supporting Documentation Requirements**

Information Requirement	Where Addressed
(1) <u>Site details</u> : Provide high-quality aerial photographs, maps or figures that clearly depict the following:	
• the local and regional context of the proposal;	<b>Figure 1</b>
• surrounding development and any potentially affected properties; and	<b>Figure 4</b>
• the location of key infrastructure and environmental features.	<b>Figure 3 &amp; Figure 5</b>
(2) <u>Development description</u> : Provide a clear and concise summary of the proposal that describes the types of activities that will be undertaken during each stage of the development.	<b>Section 3</b>
(3) <u>Permissibility and Strategic Planning</u> : Identify the strategic planning documents, environmental planning instruments and key development standards applying to the development, including any development standards not being met.	<b>Section 4</b>
(4) <u>Preliminary environmental impact assessment</u> : Identify and prioritise the expected environmental impacts (positive and negative) associated with the development, based on a preliminary risk assessment. Briefly outline any strategies to address the impacts identified.	<b>Section 8</b>
(5) <u>Justification</u> : Explain why the site was chosen for the proposal and briefly discuss the alternatives considered. Outline the strategic context for the proposal, including the benefits to the region and/or State.	<b>Section 3.16 and Section 9</b>
(6) <u>Consultation</u> : Outline any consultation (with the community, local councils, other Government agencies) already undertaken and proposed to be carried out for the proposal.	<b>Section 5</b>
(7) <u>Capital investment value</u> : Provide an accurate estimate of the cost of carrying out the proposal.	<b>Section 3.15.4</b>

## 2 EXISTING ENVIRONMENT

### 2.1 REGIONAL SETTING

The closest township to the Project is Wyong which is located approximately 4.5 km to the east of the Project Boundary (see **Figure 1**). The F3 Freeway and Main Northern Railway Line run north – south, adjacent to the Project Boundary to the east and forms part of the major road and rail network that provides access throughout the region.

The largest proportion of the Project's underground coal extraction area is located beneath the Wyong State Forest and adjacent forested hills, including beneath part of the Jilliby SCA which was created in 2003. In the east of the Project Area is Jilliby Creek which joins Wyong River further to the south-east. Wyong River enters Tuggerah Lake, a large coastal saltwater lagoon on the Central Coast of NSW.

### 2.2 CLIMATE

As shown in **Table 2**, climatic conditions in the region are recorded at the Bureau of Meteorology (BoM) Norah Head Australian Weather Station (AWS) (data available 1995 – 2011) and Narara Research Station (partial data available 1916 – 2011, all data available 1954 – 2011). Temperatures range from an average maximum of 27.6°C in summer down to an average minimum of 4.7°C in the winter months. The predominant wind at Charmhaven is from the south-west and the predominant winds at Buttonderry are from the west north-west.

**Table 2**  
**Average Climatic Conditions Measures by BoM**

Month	Mean Daily Temperature (°C)				Mean Monthly Rainfall (mm)		Mean Monthly Rain Days	
	Norah Head AWS		Narara Research Station		Norah Head AWS	Narara Research Station	Norah Head AWS	Narara Research Station
	Min	Max	Min	Max				
January	19.6	25.7	16.8	27.6	66.9	132.4	8.0	8.7
February	20.0	25.9	17.2	27.2	101.6	152.5	8.2	8.8
March	18.7	24.8	15.4	26.0	105.2	149.3	8.3	9.1
April	15.8	22.8	11.9	26.6	127.3	137.7	8.6	8.4
May	13.1	20.0	8.3	20.3	163.0	119.2	9.9	7.6
June	10.9	18.0	6.5	17.9	133.8	129.9	8.6	7.5
July	9.7	17.2	4.7	17.5	98.6	80.7	7.6	6.4
August	10.5	18.8	5.3	19.0	69.6	73.0	5.7	6.2
September	12.8	20.9	7.7	21.3	64.6	67.6	7.1	6.3
October	14.8	22.5	10.7	23.7	56.4	84.9	6.8	7.2
November	16.7	23.4	13.1	25.1	87.0	91.7	8.4	7.9
December	18.4	24.9	15.3	26.9	65.7	102.8	6.9	7.8
<b>TOTAL</b>	<b>15.1</b>	<b>22.1</b>	<b>11.1</b>	<b>23.0</b>	<b>1,147.6</b>	<b>1,320.4</b>	<b>94.1</b>	<b>91.9</b>

Source: BoM September 2011.



## 2.3 GEOLOGY

The Wyong area is located within the north-eastern margin of the Sydney Basin and in the southern part of the Newcastle Coalfield. In this region any economic coal resources are contained within the upper part of the Permian Newcastle Coal Measures. An indicative stratigraphic column of the Project Boundary is presented in **Figure 2**. These strata outcrop to the far north and north-east of the region and dip gently to the south-west beneath the Project Boundary. The lowermost strata of the Narrabeen Group comprise the Dooralong Shale which consists of between 50 and 70 m of shales and laminites. This sequence coarsens upwards to contain beds of pebbly sandstone.

The overlying Munmorah Conglomerate is generally 70 to 80 m thick and consists of coarse and pebbly sandstones with occasional green-grey shales. Neither of these sequences outcrop in the proposed target mining area. Outcropping in the north-east of the area is the Tuggerah Formation, a 200 m thick sequence of sandstones with minor siltstones and rare conglomerates.

The Patonga Claystone, which consists of 80 to 110 m of interbedded grey-green and red-brown claystones and minor fine-grained sandstones, commonly outcrops in the lower elevation areas throughout (and immediately beneath) the Yarramalong and Dooralong Valleys. The uppermost strata of the Narrabeen Group in the area belong to the Terrigal Formation and consist of sandstones and minor siltstones. This sequence occurs through the more elevated zones of the south-western half of the Project Boundary, which is typically covered by State Forests.

Unconsolidated Quaternary silts and sands occur as fill along the Yarramalong and Dooralong Valleys and beneath Tuggerah Lake. Thicknesses of up to 50 m have been recorded. Two broad synclines, which are recognised regionally, traverse the area. The Macquarie Syncline traverses the western edge of Tuggerah Lake in a north-easterly direction. The Yarramalong Syncline traverses the extreme western edge of the Project Boundary in a similar orientation. Regional geology and the major structural features are shown for the Project Boundary in **Figure 3**.

## 2.4 COAL RESOURCE

The target coal resources for the Project are the locally coalesced Wallarah and Great Northern Coal Seams. An identified reserve of over 700 Mt has been identified within the WACJV's western Exploration Licence areas. The Project has identified an environmentally feasible, mineable coal resource of approximately 150 Mt over the total future mine area comprising a projected 42 year underground mine life. This mineable coal resource will be suitable to maintain mining at 5.0 Mtpa for the proposed 28 year operating period sought under the current application for Development Consent.

The Extraction Area, shown on **Figure 3** is a subset of the resources which lie in the WACJV's Mining Authorities. The Extraction Area is delineated to the north by a large north-west to south-east oriented dyke zone (a vertical geological feature containing igneous rock). The southern boundary of the Extraction Area is formed by a combination of Wyong River and a separate dyke system (which was also detected by airborne and ground-based magnetic surveys). Additional coal resources lie in the zone beyond the southern boundary of the Extraction Area towards this dyke system located, well south of the Wyong River. However, mining within this zone was considered not to be feasible for the Project.

GROUP	FORMATION
<b>TRIASSIC</b> <b>NARRABEEN GROUP</b>	<b>TERRIGAL FORMATION</b> (200m)
	<b>PATONGA CLAYSTONE</b> (80-110m)
	<b>TUGGERAH FORMATION</b> (200m)
	<b>MUNMORAH CONGLOMERATE</b> (70-80m)
	<b>DOORALONG SHALE</b> (50-70m)
<b>PERMIAN</b> Newcastle Coal Measures	<b>WALLARAH/GREAT NORTHERN COAL (UP TO 8m)</b>
	<b>AWABA TUFF (2-12m)</b>
	<b>FASSIFERN COAL (1-5m)</b>

Medium to coarse, grey sandstone, rare conglomerate, sporadic grey and rare red shale.

Red-brown shale, mottled green-gray in places, with fine to medium grained, green-gray sandstone.

Mottled green-gray and red-shale with medium to coarse, green-gray sandstone, rare conglomerate. Sandstone content decreases downward.

Granule to pebble conglomerate and coarse sandstone with minor green-grey shale (rare red motiles).

Coarse, conglomeratic sandstone and grey-green shale (rare red).

Dark gray shale and laminite.

<b>VALES POINT COAL (0-1m)</b>
<b>KARIGNAN CONGLOMERATE</b>
<b>WALLARAH COAL (1-3m)</b>
<b>TERALBA CONGLOMERATE (0-60m)</b>
<b>GREAT NORTHERN COAL (0-4m)</b>
<b>BOLTON POINT CONGLOMERATE (0-60m)</b>
<b>UPPER PILOT COAL</b>

-  Fine/medium sandstone
-  Coarse/very coarse sandstone
-  Sandstone/conglomerate
-  Conglomerate
-  Shale
-  Tuff
-  Coal

**Hansen Bailey**  
ENVIRONMENTAL CONSULTANTS

**Wallarrah 2**  
COAL PROJECT

## WALLARAH 2 COAL PROJECT

### Indicative Stratigraphic Column

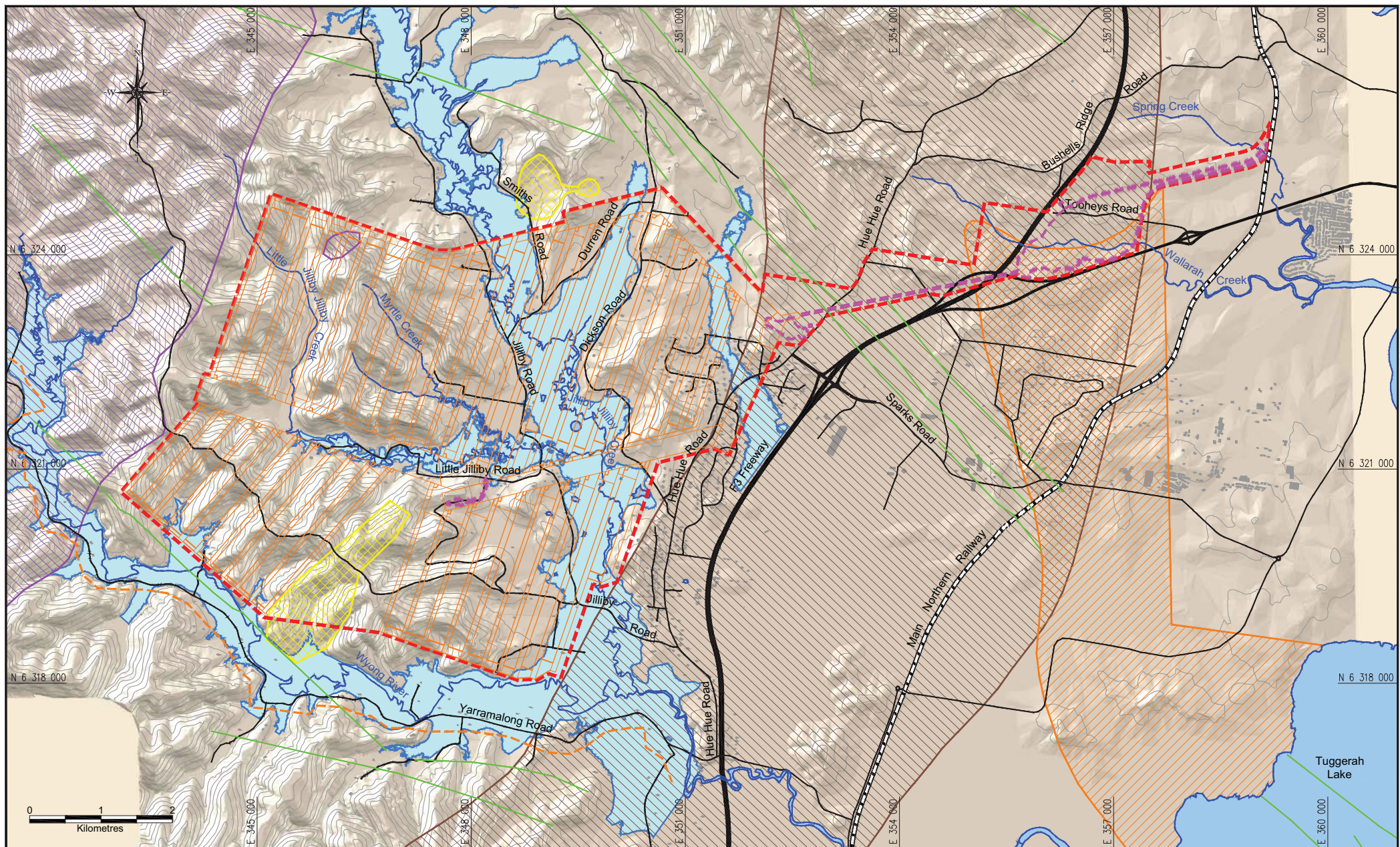
Filename: 1132 - Stratigraphic Column.ai

Date: 07.10.11

Drawn: BD

Figure  
**2**





- |                                                                                                                                                          |                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="color: red;">---</span> Project Boundary                                                                                                    | <span style="background-color: orange; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Seam Split WD13 |
| <span style="color: magenta;">---</span> Indicative Infrastructure Boundary                                                                              | <span style="background-color: white; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Seam Split WF1   |
| <span style="color: black;">---</span> Roads                                                                                                             | <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Intrusions      |
| <span style="color: black;">---</span> Railway                                                                                                           | <span style="color: green;">---</span> Dykes                                                                                               |
| <span style="color: blue;">---</span> Waterways                                                                                                          | <span style="color: black;">●</span> Residence                                                                                             |
| <span style="color: orange;">---</span> Extraction Area                                                                                                  | <span style="color: orange;">---</span> Mardi Mangrove Pipeline                                                                            |
| <span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> 1 in 100 Year Flood Extent |                                                                                                                                            |
| <span style="background-color: lightpurple; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Seam Split WA73          |                                                                                                                                            |

Hansen Bailey

**Walarah 2**  
COAL PROJECT

Source: Wyong Areas Joint Coal Venture

## WALLARAH 2 COAL PROJECT

### Mining Constraints

Cad File: 07762F.dwg

Date: 12.10.11

Drawn: JD

Figure  
**3**



The eastern boundary of the Extraction Area is where the coal seam splits into thinner units, however the coal seam thickness remains sufficient for Project roadways to be able to be driven in the coal seam within this area as may be necessary. Similarly, another coal seam split line in the west forms the western boundary of the Extraction Area.

Within the Extraction Area, the Wallarah and Great Northern Coal Seams are fully coalesced, resulting in seam thickness ranging from 4.0 m to 6.5 m. Depth of cover (from coal seam to the surface) over most of the area ranges from approximately 350 m to 550 m, increasing to a maximum of over 690 m below some heavily-timbered, steep-sided hills separating the Yarramalong and Dooralong Valleys.

Although a working section of 4.5 m can be potentially maintained over virtually the entire Extraction Area, there are areas in the east where the very conservative subsidence management approach for mine planning has indicated areas where extraction height may be limited to 3.5 m.

Working section raw ash increases from 12.5% (air dry basis (ad)) in the north-east to greater than 20% towards the Western Split. Specific Energy of raw coal generally ranges from a calorific value of 8,100 to 8,200 kilocalorie / kilogram (kcal/kg) (dry ash free basis (daf)) but decreases to 8,000 kcal/kg in areas of increased ash content. Sulphur content of the coal is consistently low at about 0.35% (ad).

The Extraction Area has been well explored with cored bore holes that have been extensively tested. Thus coal quality as well as overburden characteristics can be predicted and modelled with a high degree of confidence. A number of large diameter cores were also drilled to provide detailed sizing and quality information. The Project coal will be an attractive coal for export and domestic power station operators, featuring low moisture and sulphur, high energy, medium to high volatile matter, low nitrogen and benign ash chemistry.

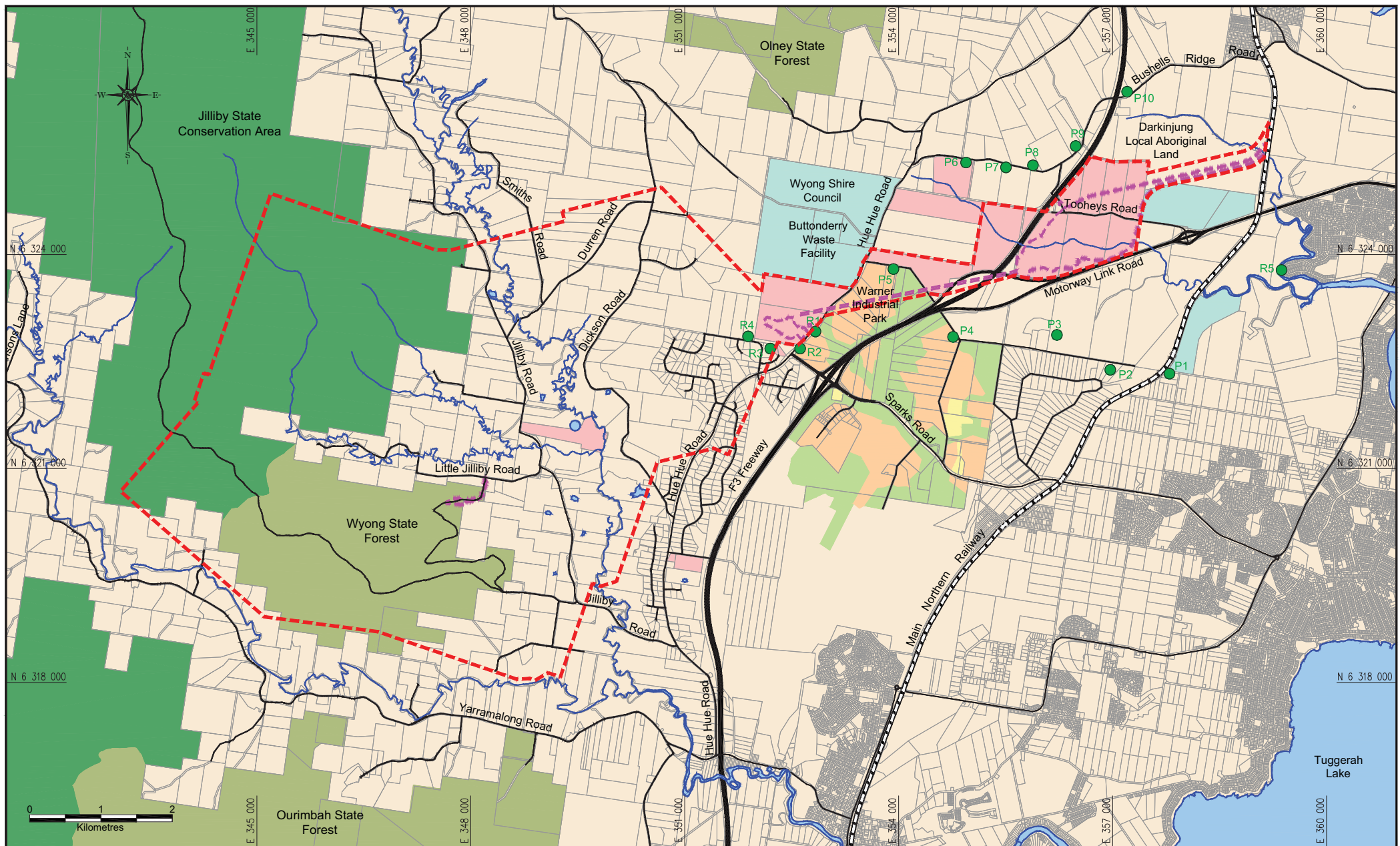
## 2.5 LAND OWNERSHIP

WACJV land ownership within and surrounding the Project Boundary is shown on **Figure 4**. All land proposed to be disturbed by the development of the surface facilities' at the Buttonderry Site and Tooheys Road Site is owned by WACJV, except for a section of the rail spur traversing Crown land and DLALC land. The West Shaft site is on land owned by State Forests. Private freehold landholders surround and occur within the Project Boundary.

Forests NSW manages land within and to the north, south and west of the Project Boundary and National Parks and Wildlife Service (NPWS) manages the Jilliby SCA located overlying and to the north and west of the Project Boundary.

## 2.6 LAND USE

The subregion containing the Project accommodates several types of land use ranging from light industrial, commercial and housing developments to small townships and small acreages. Major transport routes traverse the eastern area near the Project Boundary including the F3 Freeway, Motorway Link Road and the Main Northern Railway Line (as shown on **Figure 1**). The western area of the Project features heavily timbered hills most of which are included in Wyong State Forest.



- |                                                                                                                                                           |                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <span style="color: red;">---</span> Project Boundary                                                                                                     | <span style="background-color: lightorange; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Not Specified             |
| <span style="color: purple;">---</span> Indicative Infrastructure Boundary                                                                                | <span style="background-color: lightblue; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Other Existing Developments |
| <span style="color: black;">---</span> Roads                                                                                                              | <span style="background-color: green; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Environmental Conservation      |
| <span style="color: black;">---</span> Railway                                                                                                            | <span style="background-color: orange; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> General Industrial             |
| <span style="color: blue;">---</span> Waterways                                                                                                           | <span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Infrastructure                 |
| <span style="background-color: green; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> Jilliby State Conservation Area | <span style="color: green;">●</span> Indicative Receptor                                                                                                  |
| <span style="background-color: lightgreen; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> State Forest               |                                                                                                                                                           |
| <span style="background-color: pink; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> WACJV Owned Land                 |                                                                                                                                                           |

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**Walarah 2**  
COAL PROJECT

Source: Wyong Areas Joint Coal Venture

## WALLARAH 2 COAL PROJECT

### Land Use

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Figure  
**4**

### 2.6.1 Industrial and Commercial

The Wyong Shire (Shire) supports three main industrial / commercial centres. Enterprise Drive (Tuggerah Business Park) straddles Ourimbah Creek and links the southern lake areas with Tuggerah. The Tuggerah Straight commercial area is also close to Tuggerah, whilst the North Wyong Industrial Area links Watanobbi to the newly developing Warnervale area. Development pressure is rising for expanding industrial and commercial development in the Warnervale / Sparks Road area, the Precinct 14 area of the Wyong Employment Zone (WEZ) known as Warner Industrial Park and the Tooheys Road area (see **Figure 4**).

The WEZ was created in order to meet employment requirements associated with the anticipated growth in the Central Coast population to 2031. The WEZ creates an opportunity to attract and accommodate the needs of large firms and new forms of industry to help respond to the need for significant local employment growth. It is anticipated that WEZ will help create around 6,000 jobs by attracting firms and industries including manufacturing, warehousing, storage and research.

The Tooheys Road area is currently designated for large industrial enterprises and has been zoned accordingly. The Tooheys Road Site which will house the main surface infrastructure is located within the Bushells Ridge Precinct noted in the draft North Wyong Structure Plan and identified in the Central Coast Regional Strategy (Department of Planning 2006).

The Project will have no direct impact on residential or industrial land in the main Wyong centre.

WACJV will continue to undertake liaison with neighbouring industries and land owners including DLALC, WSC, Boral-Montoro and others. Close co-ordination with DLALC will enable the consideration of infrastructure designs which can optimise mutual outcomes between the Tooheys Road Site Development and the DLALC's development of its proposed Bushells Ridge Employment Estate project.

### 2.6.2 Residential

90% of urban development in the Shire is consolidated into 56 km<sup>2</sup> of low density residential development around Tuggerah Lake (Wyong Shire Council 1998). The four major suburban clusters in the Shire are east of the F3 Freeway and include:

- The Entrance / Southern Lakes;
- Tuggerah / Wyong;
- Central Lakes; and
- Northern Lakes (Munmorah-Lake Macquarie) (see **Figure 1**).

### 2.6.3 Rural

The dominant agricultural activity in the valleys is grazing, although turf farming also occurs in the more fertile floodplains near the Wyong River and Jilliby Jilliby Creek. Over the last 20 years, large holdings have been fragmented and converted to hobby farms, rural weekend retreats, market gardens, nurseries, and horse properties. As a result, the character is rural rather than agricultural. Scattered rural dwellings follow the river flats and the small localities of Yarramalong and Dooralong are at the head of their respective valleys.

## 2.6.4 Mining

Available natural resources have led to the establishment of a number of extractive industries to the north of the Project within the Newcastle Coalfield with coal mining traditionally being a major source of local income. The underground mines currently or recently operating in the vicinity and the status of each are listed in **Table 3**.

**Table 3**  
**Existing Surrounding Mining Operations**

ID	Name	Proximity to the Project / Status
1.	Mandalong Colliery	Approximately 15 km to the North via the F3 Freeway
2.	Cooranbong Colliery	Approximately 25 km North by road
3.	Newstan Colliery	Approximately 30 km to North
4.	Chain Valley Bay Colliery	Approximately 11 km North east via the Pacific Highway
5.	Moonee Colliery	(Closed) Approximately 20 km to North east via Pacific Highway
6.	Wallarah Colliery	(Closed) Approximately 20 km to North east via Pacific Highway
7.	Endeavour Colliery	(Closed) Approximately 10 km NE via the Pacific Highway
8.	Myuna Colliery	Approximately 20 km to North
9.	Awaba Colliery	Approximately 25 km to North
10.	Munmorah Coal Mine	(Closed) Approximately 10 km North east via the Pacific Highway
11.	Wyee Colliery (Mannering)	Approximately 10 km North east via the Pacific Highway

## 2.6.5 State Forest

State Forests dominate the area known as 'the Valleys'. The connected Wyong and Olney State Forests (parts of which have been reserved as a State Conservation Area) continue north and west into the forested Watagan Mountains, which stretch towards Wollombi and the Hunter Region. To the west of the valleys, the steep upland country continues through Dharug and Wollemi National Parks to merge with the Great Dividing Range. Ourimbah State Forest is south of the Yarramalong Valley and this area merges with the more gentle slopes of the Somersby Plateau.

## 2.7 ENVIRONMENTAL MANAGEMENT

### 2.7.1 Monitoring

WACJV has developed and implemented an Environmental Management Plan (EMP) for the Exploration Phase of the Development. The Environmental Management Plan includes a variety of mitigation and management measures to minimise social and environmental impacts. Since 1996, WACJV has also progressively developed and operated an EMP for the purposes of securing background monitoring data. The EMP has involved the collection of data relating to a range of environmental aspects, including:

- Meteorological;

- Air quality (including depositional dust, TSP and PM<sub>10</sub>);
- Noise;
- Surface water; and
- Groundwater.

A summary of the components of the EMP is provided in **Table 4** with monitoring locations shown on **Figure 5**. The EMP will continue to be enhanced and revised as required for the Project to ensure proactive and ongoing environmental monitoring and management.

**Table 4**  
**Environmental Monitoring Program**

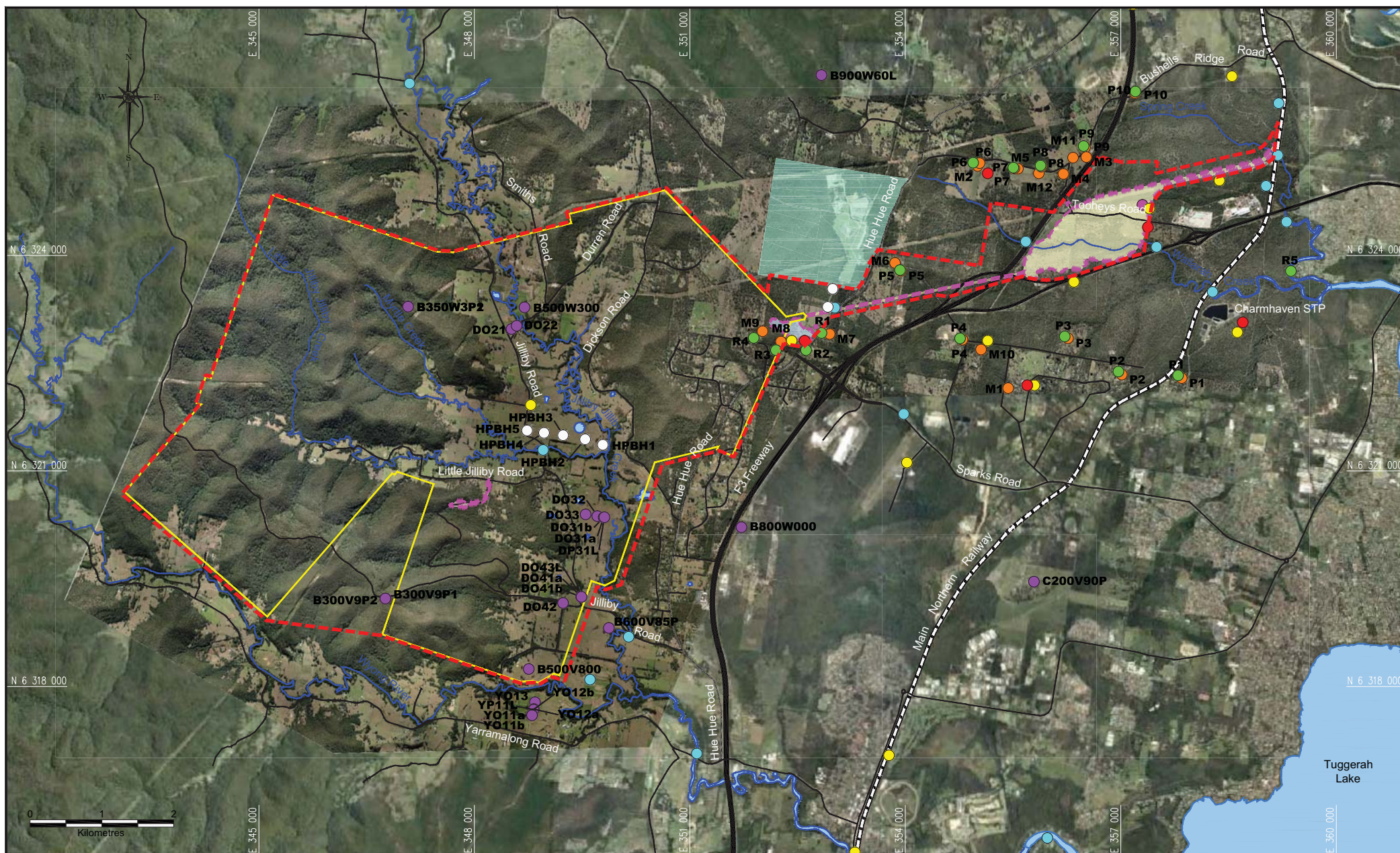
Aspect	Mechanism	Monitoring Location	Parameters Monitored
Meteorological	Meteorological Station	<ul style="list-style-type: none"> <li>• Tooheys Road Site</li> </ul>	Rainfall, Temperature, Relative Humidity, Solar Radiation, Wind Speed & Wind Direction
Air Quality – Depositional Dust	Depositional Dust Gauges	<ul style="list-style-type: none"> <li>• Six current (formerly 18) locations onsite and offsite</li> </ul>	Depositional Dust (g/m <sup>2</sup> /month)
Air Quality – Suspended Particulates	High Volume Air Samplers (HVAS)	<ul style="list-style-type: none"> <li>• Buttonderry Site &amp; Tooheys Rd Site</li> </ul>	TSP (µg/m <sup>3</sup> ) & PM10 (µg/m <sup>3</sup> )
		<ul style="list-style-type: none"> <li>• Formerly also South-east, South and North of Tooheys Road Site</li> </ul>	
Noise		<ul style="list-style-type: none"> <li>• 12 measurement locations onsite and offsite</li> </ul>	Sound frequencies propagation and attenuation
Surface Water	Sample Collection	<ul style="list-style-type: none"> <li>• 14 sampling sites (formerly 25) on Jilliby Jilliby, Wallarah, Spring and Buttonderry Creeks and Wyong River</li> </ul>	Range of water quality parameters including EC, pH, TDS & TSS
Groundwater	Sample Collection and vibrating wire piezometers	<ul style="list-style-type: none"> <li>• Previously 17 dedicated bores</li> <li>• Five additional alluvial bores in Dooralong Valley established 2010</li> <li>• Two monitoring bores at Buttonderry Site established 2010</li> </ul>	Water Quality (range of parameters), depth and speciation analysis. Water level temporal and spatial analysis

### 2.7.2 Land Disturbance Protocol

WACJV will also implement a Land Disturbance Protocol for the Project which will require that the Environmental Manager (or delegated specialist) will carry out an inspection of proposed disturbance areas prior to any disturbance activities occurring.

This Protocol also provides a process to ensure compliance with the relevant licences and approvals and that appropriate environmental safeguards and mitigation measures are put in place prior to any disturbance.





**WALLARAH 2 COAL PROJECT**

## Environmental Monitoring Program

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Figure **5**



### 3 PROJECT DESCRIPTION

This section provides a description of the Project and a discussion of the key alternatives that were considered during the development of the Project.

#### 3.1 INTRODUCTION

Development Consent is sought to mine coal within the Extraction Area for a duration of 28 years. Since the projected life of mining within the Project Boundary is in the order 42 years, a further planning approval will be required for continuation of mining after Year 28.

The Project will involve the underground extraction of export quality thermal coal with associated surface facilities and infrastructure. The Project is generally comprised of an underground longwall mine, coal handling and storage facilities, rail loop and loading infrastructure, an underground drift entry, ventilation shafts, gas and water management facilities and administration buildings.

Key features of the Project are shown on **Figure 1** and include:

- The construction and operation of an underground mining operation extracting up to 5.0 Mtpa of export quality thermal coal by longwall methods at a depth of between 350 m and 690 m below the surface within the underground Extraction Area;
- Mining and related activities will occur 24 hours a day 7 days a week for a project period of 28 years;
- Tooheys Road Site surface facilities on company owned and third party land (potentially leasehold land) between the Motorway Link Road and the F3 Freeway which will include (at least) a rail loop and spur, stockpiles, water and gas management facilities, workshop and offices;
- Buttonderry Surface Facilities on company owned land at Hue Hue Road between Sparks Road and the Wyong Shire Council's (WSC) Buttonderry Waste Management Facility. This facility will include (at least) the main personnel access to the mine, main ventilation facilities, offices and employee amenities;
- An inclined tunnel (or "drift") constructed from the coal seam beneath the Buttonderry Site to the surface at the Tooheys Road Site;
- The ability to receive, stockpile and rail coal from other sources at the Tooheys Road Site within the approval limits sought. This capability could result in a reduction in overall road haulage of coal between the Central Coast and the Newcastle region;
- Potential land subdivision to allow a lease over a rail spur easement at the Tooheys Road Site;
- Construction and use of various mining related infrastructure including water management structures, water treatment plant (reverse osmosis or similar), generator, second air intake ventilation shaft, boreholes, communications, water discharge point, powerlines, and easements to facilitate connection to WSC (after July 2013, the Central Coast Water Corporation) water and sewerage connections in future;

- Capture of methane for treatment initially involving flaring as practicable for greenhouse emission management and ultimately for beneficial use of methane such as electricity generation at the Tooheys Road Site;
- Transport of coal by rail to either the Newcastle port for export or to domestic power stations;
- A workforce of approximately 300 full-time equivalent employees; and
- Rehabilitation and closure of the site at cessation of mining operations.

The land which is the subject of the Project Development Application comprises the area within the Project Boundary on **Figure 1** and excludes the surface (defined as lands to a depth of 50 m from the surface) of the Jilliby SCA (shown in green). Exclusion of the surface of these lands however does not preclude these areas below 50 m from the surface being used for purposes associated with the underground mining project. It also does not preclude the Project use of existing roads and surface land access for a variety of purposes in this area (such as for monitoring, exploration and other surface activities) to be outlined in the Wallarah 2 EIS and likely to be necessary to meet the conditions of the Development Consent.

### 3.2 MINING OPERATIONS

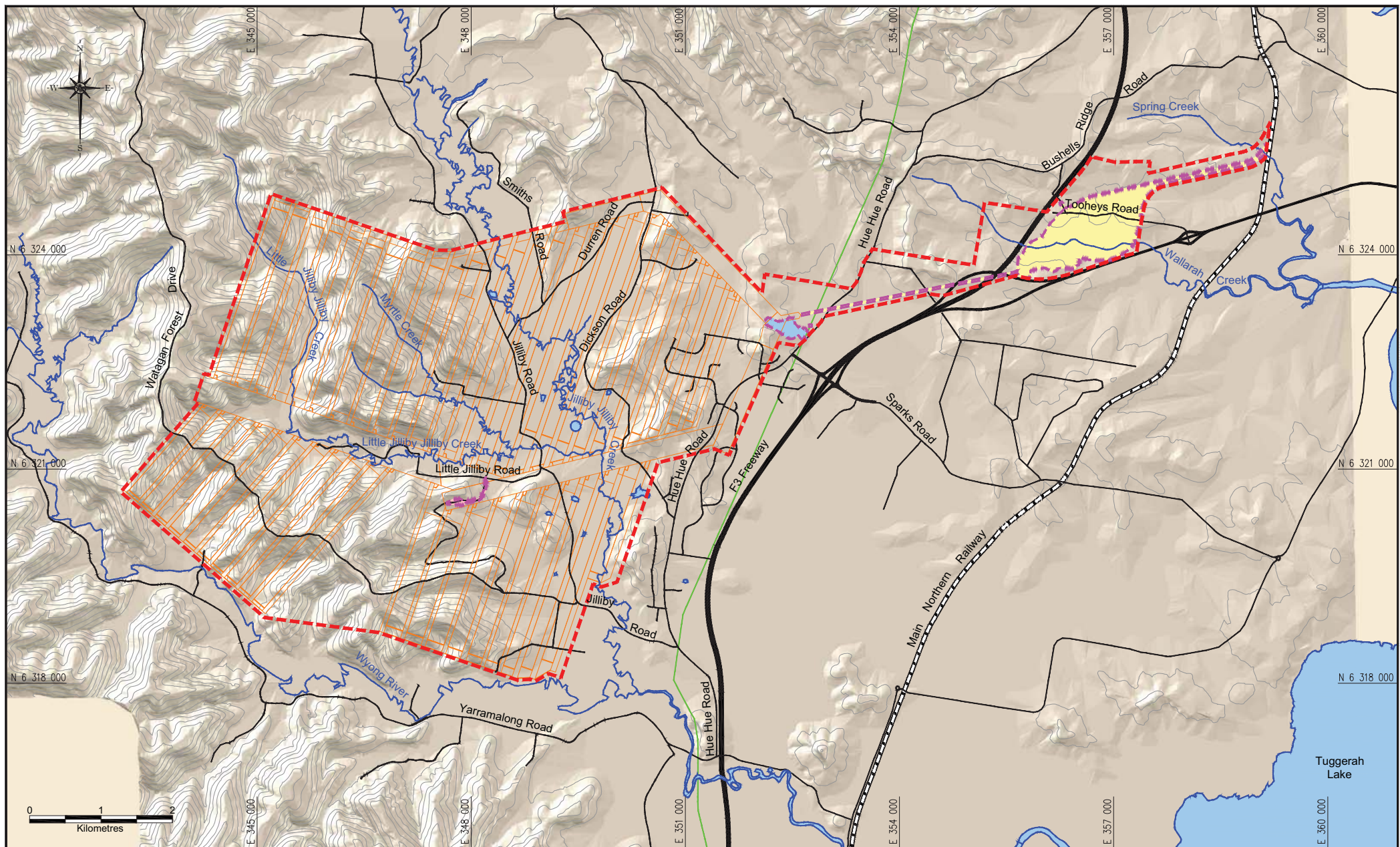
Due to the size of the resource, the large depth of cover and the corresponding high cost of surface to underground access, a high production mining method is required. Analysis of the various options has concluded that longwall mining provides the best option in terms of workforce safety, financial viability, production capacity, environmental considerations and resource recovery.

The Extraction Area is shown in **Figure 5** and the longwall panel extraction sequence is shown on **Figure 6** and **Figure 7**. Evaluation of alternative layouts indicated that the proposed mine plan is the preferred layout. The W2CP EA outlined the mining alternatives and noted that some minor adjustments to final panel orientation and geometry may be made as a result of ongoing environmental and engineering studies as well as stakeholder consultation.

As well as proposed variations in extraction height throughout the Extraction Area, the Project layout incorporates a variety of longwall panel widths in order to optimise economic reserve recovery taking into account environmental and subsidence constraints (see **Figure 3**):

- The use of 120 m and 150 m wide longwall panels below the north-eastern portion of the Hue Hue Mine Subsidence District (MSD);
- Between 150 m to 200 m wide longwall panels depending on depth of cover (coal seam to the surface) below the 1-in-100 year flood zone; and
- Predominantly 250 m wide elsewhere.

Panel width varies along the length of one panel, as the panel moves from one zone to another zone of higher or lower permissible tilt levels. This element of the subsidence management process approach in mine design has been well demonstrated elsewhere to ensure successful outcomes. The narrow section of the variable width panel would have a three-heading gate road on the tailgate side of the panel.



- Project Boundary
- Indicative Infrastructure Boundary
- Roads
- Railway
- Waterways
- Indicative Longwall Layout
- Proposed West Shaft Site
- Proposed Buttongery Site
- Proposed Tooheys Road Site
- Powerline

Hansen Bailey

**Walarah 2**  
COAL PROJECT

Source: Wyong Areas Joint Coal Venture

## WALLARAH 2 COAL PROJECT

### Conceptual Project Layout

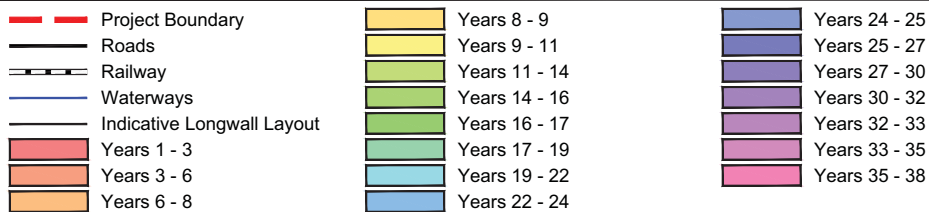
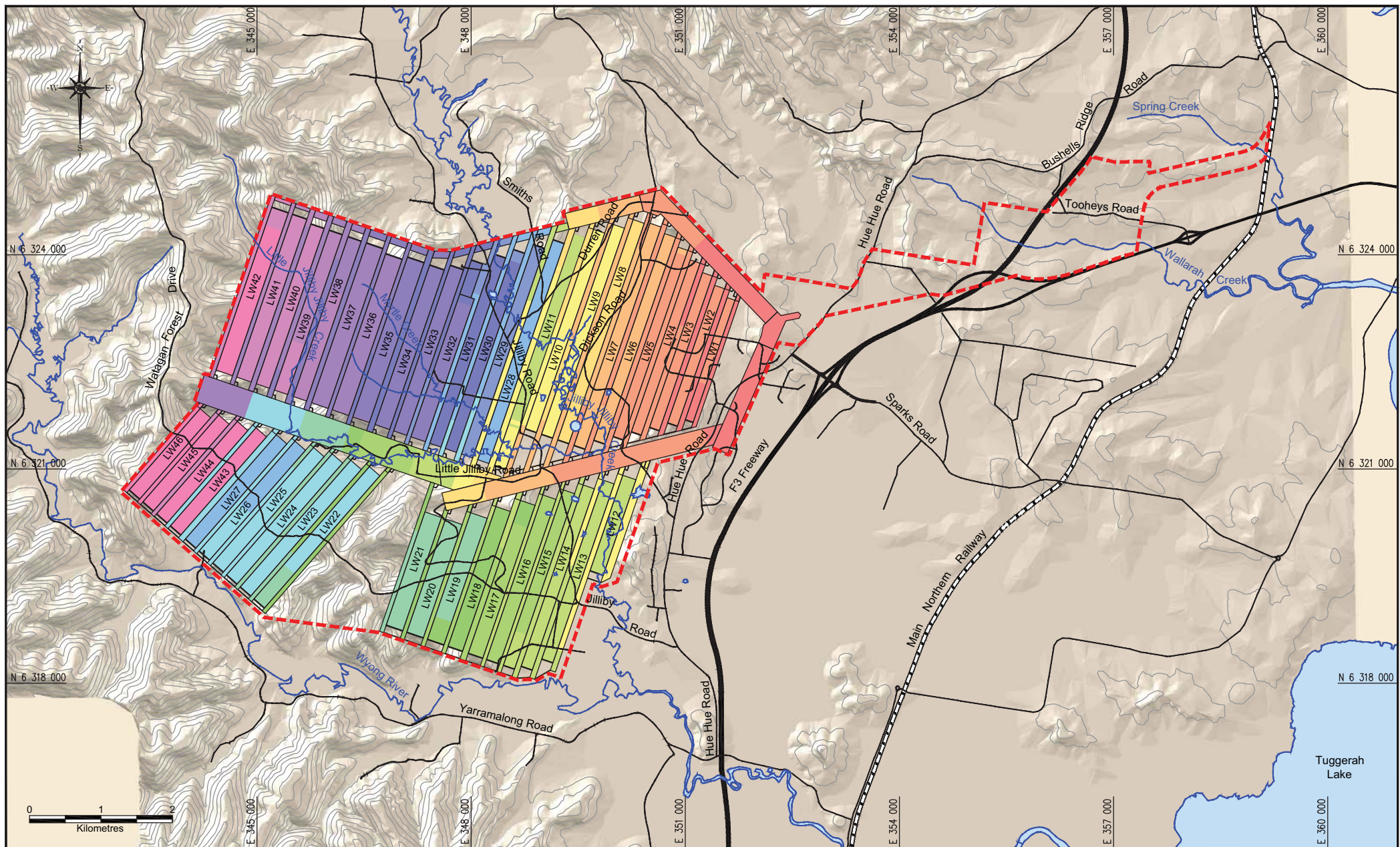
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Figure  
**6**





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## WALLARAH 2 COAL PROJECT

### Conceptual Mine Plan

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Figure  
**7**

As shown in **Figure 7**, extraction commences in the north-eastern corner of the Extraction Area, adjacent to the pit bottom facilities. Due to surface subsidence restrictions, the initial longwall panels are relatively narrow. To commence longwall extraction as early as possible, the first 11 longwall panels are extracted from a set of northern main headings (MNW1), which run parallel and adjacent to the major dyke zone. A five-roadway configuration is expected for these permanent main headings. A protection barrier of 120 m was applied to ensure adequate separation from the dyke zone. The main headings terminate just east of the Smiths Road intrusion.

While these first 11 longwall panels are being developed and extracted, an additional development unit would drive the initial southern main headings, proposed to consist of four headings in a south south-west direction (MSW1, located east of and parallel to the first longwall panel). Then up to five headings are developed in a west south-west direction (MSW2) that crosses deep under the alluvial valley to below the Wyong State Forest. In contrast to the longwall panels, the main headings are mined using continuous miner equipment. These headings are permanent tunnels for access and services throughout the mine life and do not result in any surface subsidence.

The western extremity of the MSW2 main headings is the selected location for an additional downcast ventilation shaft known as the West Shaft, as shown in **Figure 6**. This shaft is required prior to longwall extraction from Longwall 12 (LW12) to LW21 to augment the ventilation function of that shaft located at the Buttonderry Site. Following extraction of LW1 to LW11, extraction of LW12 to LW27 will commence in the south-east area. LW28 to LW34 are located deep below the alluvial valley and LW35 to LW44 are located below the western forested hills area. This proposed sequence provides the following advantages:

- Better quality coal is extracted first, improving Project economics;
- Better mining conditions are anticipated, as entry into the Awaba Tuff floor areas is delayed;
- Enable extensive subsidence monitoring experience to progressively occur to ensure validation of subsidence models and behaviour prior to mining beneath the alluvial valley area and the western forested hills area; and
- Continual development and refinement of adaptive management approaches throughout the Project.

Continuity of the southern longwall panels is interrupted by Smithys Sill to the west, a large igneous geological intrusion feature. This effectively splits the southern longwall panels into two discrete blocks. Extraction of the southern panels continues until LWS16 and involves extension of the southern main headings with eight headings (MW1) driven to the western edge of the Extraction Area. Again, the panels in the south-west area are designed to avoid the Wyong River system and the Mardi-Mangrove Pipeline water supply infrastructure (**Figure 3**).

After the initial panels are extracted in the north-east area (LWN1 to LWN11), mining shifts to the south-eastern panels until a deterioration in coal quality in the south-west of the Extraction Area results in extraction moving back to the north-western panels (LWN12 to LWN27). As this north-western set of panels is to be extracted from the southern main headings, longwall retreat will be down-dip (as opposed to panels LWN1 to LWN11 which will be mined from the northern main headings). Thus, it is proposed that only these north-western panels will be mined in a north to south direction. All other longwall panels will be mined from south to north.

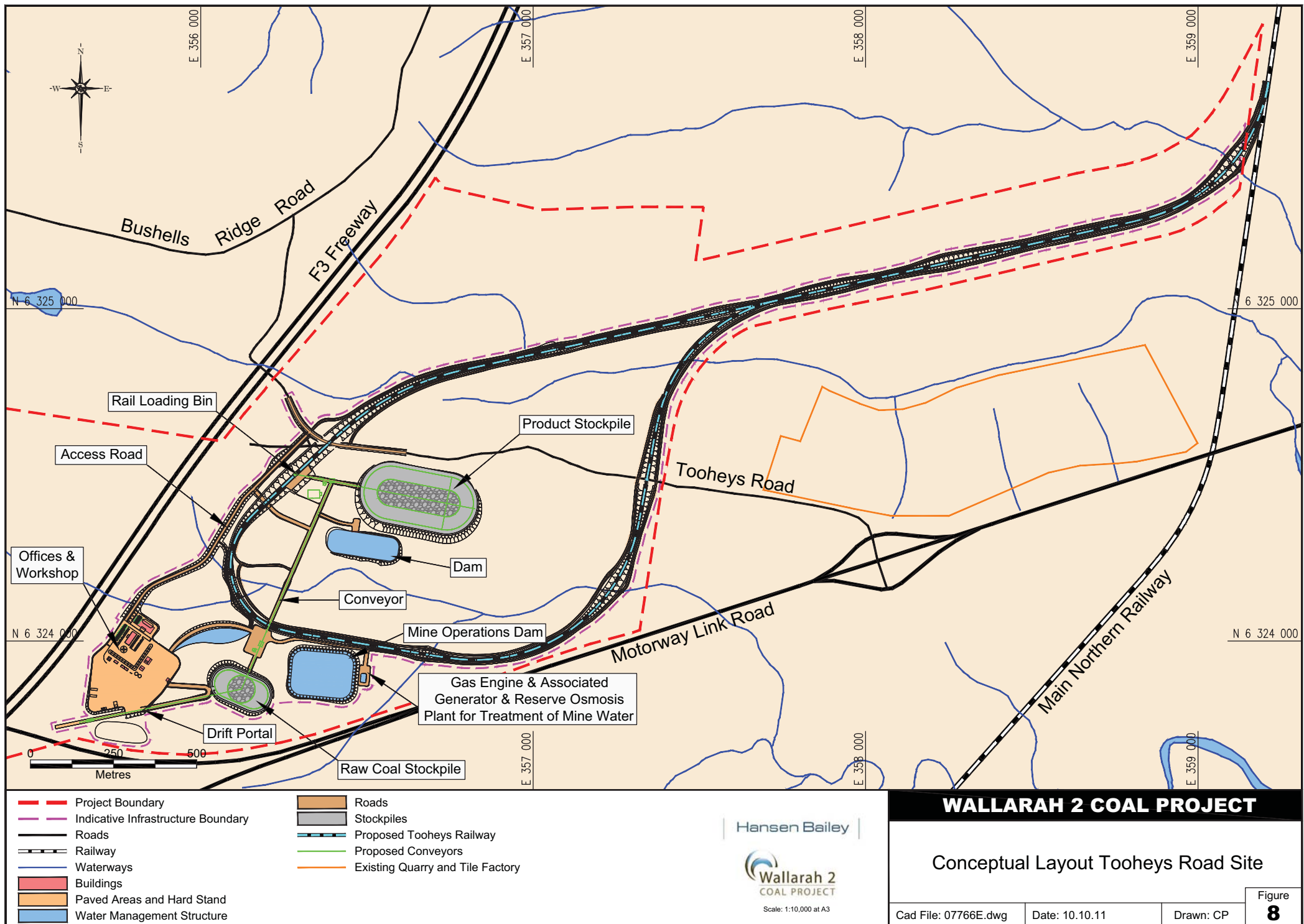
### 3.3 TOOHEYS ROAD SITE

The proposed general layout of the Tooheys Road Site is shown in **Figure 8** and includes:

- Rail spur, loop with coal loader and two rail overbridges along Tooheys Road;
- Office facility (inclusive of administration offices, bathrooms, training facilities);
- Site access roads including at least partial closure and relocation of Tooheys Road;
- Mine access drift and portal;
- Gas extraction and treatment plant;
- Coal stockpiles and material handling facilities;
- Car parking;
- Surface workshop and secure store;
- Bulk dry goods store;
- Open yard storage;
- Air compressor installation;
- Vehicle wash down bay, incorporating water treatment plant;
- Fuel, oil and flammable goods storage area;
- Fire fighting water storage tanks and surface fire station;
- Electricity powerlines, switchyard and transformers;
- Sewage treatment facilities;
- Environmental monitoring;
- Mine operations waste water dam and surface runoff settling ponds;
- Gas engine and associated generator; and
- Water treatment plant (reverse osmosis plant or similar) for treatment of mine water.

The Tooheys Road Site will be accessed off the Motorway Link Road via a sealed road. The road will have 3.5 m lane widths and 2 m shoulders. The width of the seal will be at least 8.0 m. Tree screening and landscaping is proposed either side of the road up to the main administration building and adjoining car park.







The facilities at the Tooheys Road Site for handling the ROM coal consist of:

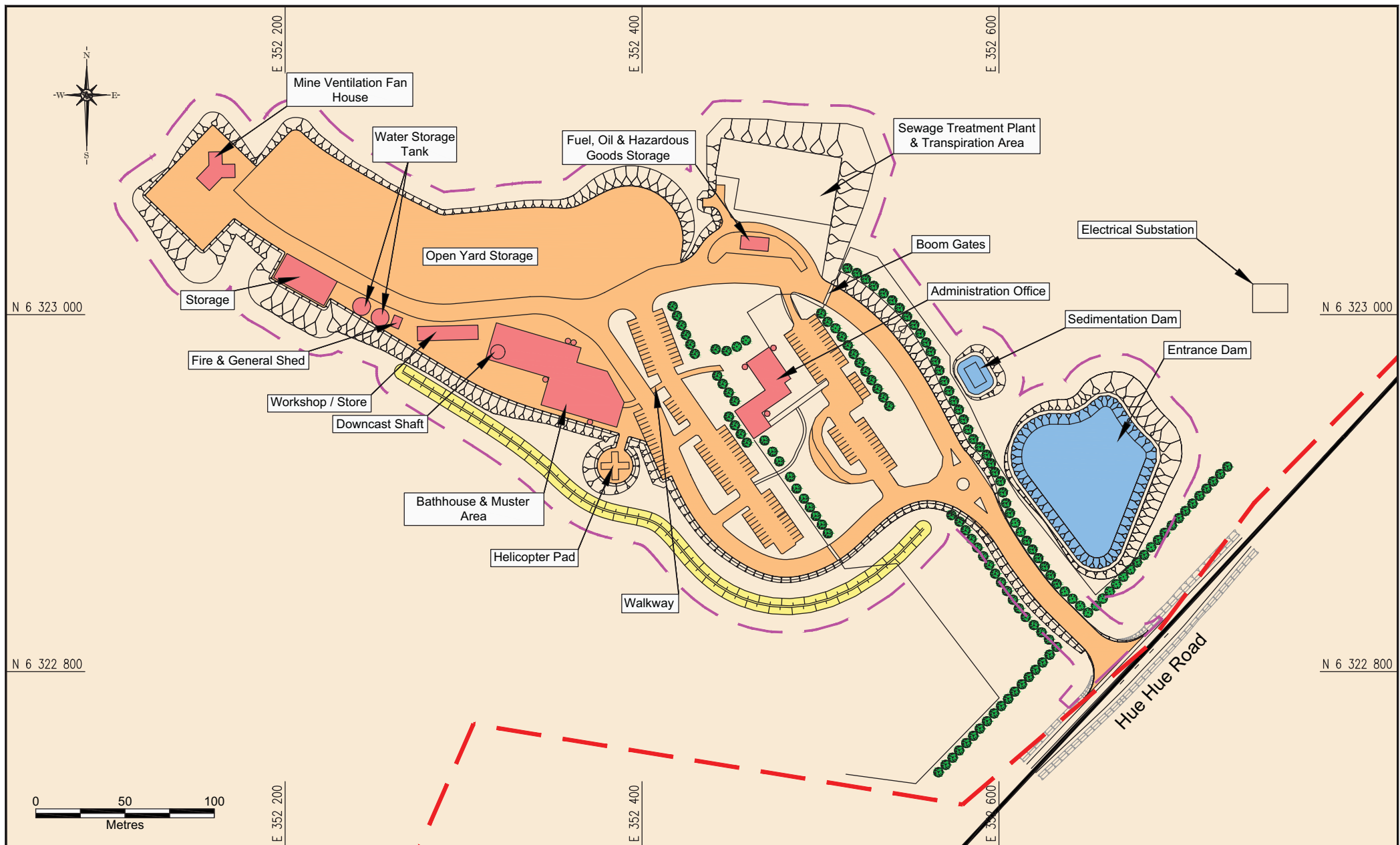
- 4,000 tonnes per hour (t/h) receival system;
- 50,000 t raw coal surge stockpile;
- 2,000 t/h raw coal reclaim, crushing and stacking system;
- 2,000 t/h overhead tripper to stack crushed coal on the 250,000 t product stockpile with additional emergency stockpile capacity with dozer push out;
- Tunnel reclaim system under the product stockpile;
- 4,500 t/h train loading system including a loading bin of approximately 250 t; and
- Balloon loop off the main railway line that will be able to hold three of the anticipated 3,400 t trains.

### 3.4 BUTTONDERRY SITE

The proposed general site layout of the Buttonderry Site is shown in **Figure 9** and consists of:

- Upcast ventilation shaft and fan for mine ventilation;
- Downcast ventilation shaft for mine ventilation and man-riding;
- Main office (inclusive of administration offices and training rooms);
- Bathroom and showers facilities;
- Car parking;
- Small fuel, oil and hazardous materials storage area;
- Explosives magazine;
- Fire fighting water storage tanks for surface fire;
- Sewage treatment facilities;
- Easement for future connection to WSC sewage and water facilities;
- Emergency services helicopter landing area;
- Air compressor installation;
- Environmental monitoring;
- Ballast borehole(s); and
- Electrical switchyard, hardstand and pollution control facilities.

The Buttonderry Site will be accessed off the Hue Hue Road via a sealed road. The road will have 3.5 m lane widths and 2.0 m shoulders. The width of the seal will be 9.0 m. Tree screening and landscaping is proposed either side of the road up to the main administration building and adjoining car park.



- Project Boundary
- Indicative Infrastructure Boundary
- Roads
- Buildings
- Paved Areas and Hardstand
- Water Management Structure
- Noise Attenuation Bund

Hansen Bailey



## WALLARAH 2 COAL PROJECT

### Concetual Layout Buttonderry Site

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Figure  
**9**

### 3.5 WESTERN VENTILATION SHAFT

A second ventilation shaft to augment the original shaft at the Buttonderry Site will be required around Year 10 and will be located in the Wyong State Forest as shown approximately on **Figure 10**. This future western shaft facility will be a downcast shaft (for air intake to the underground).

Only limited facilities will be required at this site however the site will also serve as a secondary emergency access point. The downcast ventilation shaft will be approximately 5 m in diameter and to about 490 m depth. Electricity supply to the site will be provided.

### 3.6 PRODUCT TRANSPORT

The Project will transport all coal to the north by rail either to the Port of Newcastle or to domestic power stations. The Project will construct a rail spur from the Tooheys Road Site to the Main Northern Railway for distribution of product. A rail loop with train loading facilities with a capacity of 4,500 tph will be constructed to facilitate the loading of product coal.

The Project also includes a potential subdivision to accommodate the rail spur and a section of the loop leading from Main Northern Railway to the Tooheys Road Site. The purpose of any subdivision that may be required is to allow a long term lease to be established from the DLALC and Crown Lands.

The Project will also allow the receipt, stockpiling and rail transport of product coal from other mines in the vicinity of the Project within the approval limits sought in this application. Transportation and any additional infrastructure and approval requirements would be the responsibility of any other proponent seeking to utilise this facility.

### 3.7 MINE WATER MANAGEMENT AND INFRASTRUCTURE

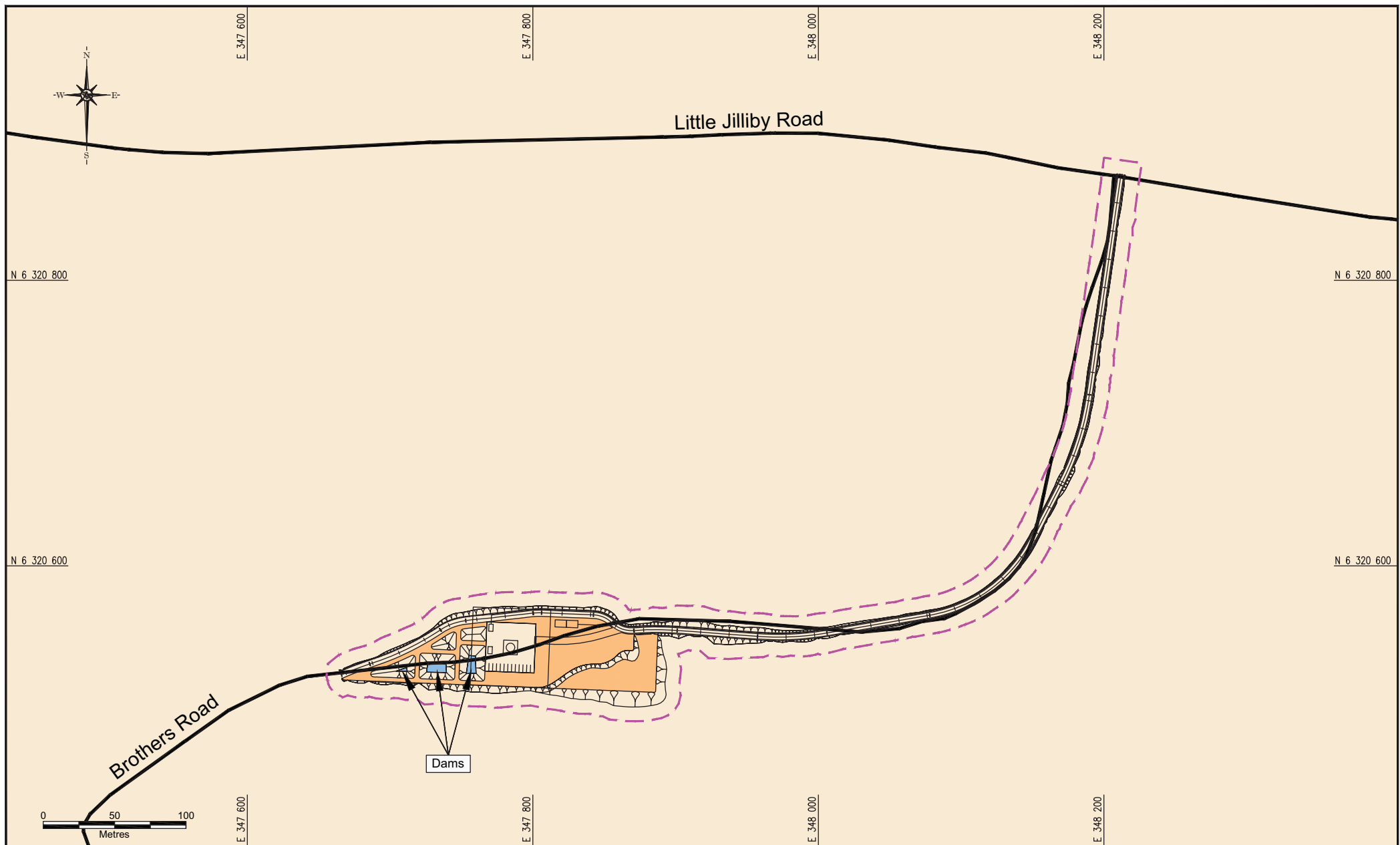
Water management entails a number of separate though inter-related components. These are:

- Water produced from the underground workings;
- Demands for underground operations, coal handling, dust suppression and potable use;
- Water treatment, particularly water from the coal seam;
- Pollution controls and drainage to ensure that stormwater runoff is contained and treated prior to release or reuse; and
- Overall site water balance and determination of periods of deficit and excess.

#### 3.7.1 Water Management System

A series of clean water catchment dams, diversions, sedimentation dams and culverts will be required throughout the life of the Project. Where necessary, culvert crossings will be provided beneath the Mine Access Road and proposed rail spur to maintain flow. Detailed requirements for various other mine water structures and erosion and sediment control devices will be developed throughout the assessment of the Project in the Walarah 2 EIS.

The final design and operation of the water management system will be influenced by, among other things, the availability of the mine to be serviced from and integrated with the regional potable water supply system and the regional sewerage system.



- Indicative Infrastructure Boundary
- Roads
- Water Management Structure
- Paved Areas and Hardstand

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## WALLARAH 2 COAL PROJECT

### Conceptual Layout Western Ventilation Shaft

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Figure  
**10**

The mine will require approximately 1 Megalitres (ML)/day of water and, apart from the initial years of operation, can be expected to be not only self-sufficient in water need but may provide to other water users in the region surplus water of appropriate quality.

Water which may be encountered by underground workings will be pumped from the mine for treatment. The water will be derived primarily from the coal seam as well as recycled water returned underground to supply water to mining equipment. The collected water will be treated to meet criteria prior to discharge or to being directed offsite for reuse options.

The proposed treatment system will likely be via a RO process that is well proven as being capable of producing up to potable standard treated water for reuse on site and suitable water quality to enable other beneficial uses, even supply to the Wyong Water Supply Catchment if necessary. However, the final water treatment and onsite / offsite water reuse options will be clarified following further consultation with water stakeholders up to the actual design stage.

Preliminary engineering designs have been undertaken which has established the likely footprint of the Mine Operations Dams and water treatment plant at the Tooheys Road Site.

Water from the mine will be directed to the mine operations dam which has been sized to accommodate up to two months' supply and storage requirements for the overall mine operations (i.e. 120 ML). The water supply for dust suppression of the raw coal stockpile will be supplied from the runoff-fed portal dam and, if required, via the main mine waste water dam (mine operations dam). The product coal stockpile, contained within the controlled drainage area inside the rail loop, will be serviced by a smaller dam (stockpile dam) which will be supplied by local runoff and the mine operations dam.

### **3.7.2 Water Treatment (RO or Similar) Plant**

The groundwater encountered by the mine workings will range in salinity from 1,800 to 9,000 mg/L total dissolved solids (TDS), and will be treated at a desalination plant utilising the technique of reverse osmosis (RO) or similar. A RO plant will be capable of removing the high levels of TDS. The process involves the passing of the flow through a membrane under high pressure which will produce a brine that will be much higher in salt concentration than the feed water and a filtrate (treated water for re-use) which will be much lower in salt concentration.

The RO plant will be supplied as a containerised unit (packed in a standard shipping container). For the ultimate volume predicted to be produced by the mine it is possible that up to three units in total each capable of processing 1 ML/day will eventually be required.

The filtrate produced from the RO plant will be used first to satisfy the mine's operational water demand. The remainder of the treated water will be surplus water that could be available to supply other industries, be directed to the Gosford Wyong Water Supply Scheme or be released for environmental flows within surrounding creeks.

The initial mine water make of approximately 0.1 ML/day will result in very small treatment throughput in the RO plant. Consequently, initial brine quantities will be produced from as little as 0.02 ML/day. It is proposed that this brine water will be returned to the previously extracted underground workings, referred to as goaf.

The brine water returned underground will represent a minor proportion (less than 20%) of the water pumped from the mine daily as part of normal mine water management arrangements. That is, there remains a continued net export of water from the mine rather than any build-up of water in the mine. As all of the salinity in the brine material is sourced from the underground saline groundwater intercepted during mining, there will be an approximate steady state salinity load maintained in the regional deep hardrock groundwater. This groundwater zone is of no interest for potential agricultural or industrial uses due to both its low yield and poor water quality.

Subject to further evaluation of gas management options, it will be possible to generate electricity using the gas from the mine to power the RO Plant (estimated at 56 kW per unit). Water from the mine operations dam will be pumped to a disc screen and then through a micro filtration membrane before going through the RO process to allow for the efficient operation of the plant.

### **3.8 GAS EXTRACTION AND UTILISATION**

Investigations into the gas content and extraction have been undertaken by GeoGAS Pty Limited since 1997. A total of 105 gas content samples were used in the assessment and included all coal seams within the proposed Extraction Area.

The work has confirmed that the gas content is generally restricted to the coal seam and consists of greater than 95% methane at an in-seam content ranging from 6.0 to 8.9 m<sup>3</sup>/t. Mine planning and scheduling have taken account of gas drainage methods that propose both pre-mining and post-mining operations. Pre-mining gas drainage will include drilling of boreholes underground within the coal seam ahead of mining and post-mining gas drainage will involve the capture of gas from sealed mining areas via underground pipelines.

Collected gas will be brought to the surface at the Tooheys Road Site for processing. In the initial years of operation it is unlikely that sufficient quantities of gas will be produced to allow commercialisation of the resource. The collected gas will be flared during this time. Flaring will occur as early as practical during the interim period and will assist in providing a major greenhouse emissions reduction.

As the underground extraction area expands, commercial opportunities will be available for gas management and utilisation. One possible option is to pipe the gas directly to a local gas-fired power station which is to be fed by a dedicated pipeline located in close proximity to the Tooheys Road Site.

Other options under consideration include supply to the local gas distribution pipeline network, fuel supply to a nearby coal-fired power station for use as an alternative or adjunct fuel, and the potential to install onsite electricity generation. The nearby Buttonderry waste disposal facility owned by WSC has recently installed a landfill gas collection system and treatment plant to reduce its greenhouse emissions. WACJV has liaised with WSC in relation to the general relationship of the respective gas management intentions. WACJV will continue to evaluate the viability of coordinated gas management and usage opportunities with WSC and other stakeholders.

### **3.9 REJECT AND TAILINGS DISPOSAL**

The WAJCV is targeting a policy of zero rejects by avoiding the need to include a coal washery as part of the Project. By avoiding the need to have a washery, the production of coarse rejects or fine tailings will not be necessary. This in turn removes the need for coal reject disposal as well as significantly reducing the Project's water consumption.

However, a small amount of rock that is separated from the ROM coal supply prior to the CHP will need to be disposed of offsite. This rock will be predominantly large flat pieces of roof stone that have passed through the crusher and this material will report to a storage bin. Trucks will transport the stone to nearby, appropriately licensed facilities on an 'as needs' basis. Typically, this will involve around one truck load per day.

Clean excavated waste rock will also be created during the construction of the drift and shafts. This amounts to approximately 156,000 m<sup>3</sup> for the Tooheys Road Site and approximately 20,000 m<sup>3</sup> for the Buttonderry Site. These figures assume a 25% swell factor for the re-compacted material. It is intended to use this material for the creation of perimeter bunding and landscaping features on the two sites.

Cut and fill requirements of the railway construction will be subject to detailed design.

### **3.10 WORKFORCE AND HOURS OF OPERATION**

It is anticipated that the Project will require 300 full time equivalent employees, around 70% of which will be targeted to be recruited from the Central Coast and immediately adjacent region. The majority of these employees will work from the Buttonderry Site while approximately 20 workers over three shifts will be based at the Tooheys Road Site.

Maintenance activities, deliveries, coal processing, coal transport and mining operations will occur 24 hours a day, seven days a week.

### **3.11 POWER**

High voltage electricity is available at the Buttonderry Site which will also be utilised for the Tooheys Road Site.

A 132 kV/11 kV Switchyard Substation will supply power to the mine access, surface facilities and underground works at the Buttonderry Site. The 132 kV supply will be provided by Energy Australia from their 132 kV feeder 957, near Hue Hue Road.

Power supply for the CHP and surface infrastructure at the Tooheys Road Site will be provided by a private electrical feeder from the 132 kV/11 kV Substation at the Buttonderry Site. This feeder will be via an easement from the Buttonderry Site to Tooheys Road Site within the Project Boundary.

### **3.12 BUILDINGS AND FACILITIES**

A significant amount of work has been undertaken to determine the optimum sites for the surface facilities. Based on this work, the Tooheys Road Site was selected for the mine and coal handling infrastructure. Finalisation of some layout aspects, such as road alignments, will be subject to stakeholder consultation (including DLALC).

### 3.13 MINING CONSTRAINTS

The Project's comprehensive environmental and engineering studies to date have addressed a number of identified constraints that have been taken into account in the mine planning and include (but are not limited to):

- The need to safeguard water supply catchment functions and infrastructure;
- Houses located within the Hue Hue MSD;
- Houses located within the Dooralong and Yarramalong Valleys;
- Floodplains and streams of both Dooralong and Yarramalong Valleys;
- Geological constraints including identified igneous intrusions, faults and coal quality; and
- Protection of public infrastructure such as roads, railways, and power lines.

Other issues which have had an impact on the mine plan include the location of the pit top and ventilation shaft sites which in turn have been located away from residences but have the benefit of good access to the F3 Freeway (Buttonderry and Tooheys Road Sites) and main northern railway (Tooheys Road Site).

**Figure 3** shows the location of the Extraction Area and key mining constraints including the location of the Hue Hue MSD, main watercourses, the 1-in-100 year flood extents, coal seam split / coalesced zones, geological intrusions and structure, and existing buildings.

The major dyke trend is approximately north-west to south-east as shown in the portrayal of aeromagnetic-derived geological structures in **Figure 3**. Geological structural features occur mostly with an orientation in the 140-145 degree range.

### 3.14 MINE PLAN VARIATIONS TO ADDRESS CONSTRAINTS

There have been numerous permutations of the mine plan and Project layout to address geological and environmental constraints. These variations are outlined below.

#### 3.14.1 Residences

Longwall panel width and extraction height were reduced in the Hue Hue MSD in order to ensure that specific tilt and strain requirements for subsidence are complied with. Panel width has been reduced to between 125 m and 155 m while extraction height has been reduced to between 3.5 m and 4.0 m. This ensures that the predicted levels of less than 4 mm/m tilt and 3 mm/m strain not only conform to the requirements of the Hue Hue MSD but also fall within the design criteria of houses constructed to the subsidence standards specified by the Mine Subsidence Board (MSB).

The MSB is a service organisation operating for the community in coal mining areas of NSW, and is responsible for administering the *Mine Subsidence Compensation Act 1961* (MSC Act). If any damage to improvements or to household or other effects arises from subsidence, it will be fully compensated by the MSB at no cost to the landowner.



### 3.14.2 Waterways

The mine plan has been amended to both ensure the protection of surface water flow and to continue the existing range of subsurface contributions to water flow in the long term. These amendments required assessment and management of the risks to the long term integrity of the near surface alluvial aquifer. The main amendments included:

- Reducing panel widths to between 150 m and 200 m, depending on depth of cover, for the duration of mining beneath the Jilliby Jilliby Creek floodplain;
- Layout of the mine plan and mining sequence to ensure that, as the mining progresses westwards, the crossing beneath the Dooralong Valley floodplain occurs in the most expeditious and responsible manner;
- Terminating longwall panels short of the Wyong River;
- Terminating longwall panels short near the confluence of Jilliby Jilliby Creek and Little Jilliby Jilliby Creek;
- Sequencing panel extraction to minimise effects on flows such as pooling; and
- Relocation and re-orientation of the main headings beneath the alignment of the Little Jilliby Jilliby Creek and floodplain in order to maintain flow gradient while avoiding risk of channel breakout during major flood events.

These interactive design amendments have been made to address identified environmental risks, and then remodelled to verify that the resultant mine plan had achieved the required risk reduction. This process in some cases took several iterations where subsidence prediction models were re-run in order to confirm the results. A high level of confidence can therefore be given to the impact assessment.

### 3.14.3 Flood Regimes

Several amendments were made to the panel layout and location of the main headings to reduce the effects of low level flood events on the functions of Jilliby Jilliby Creek and Little Jilliby Jilliby Creek. The amendments were designed to minimise the risk of channel scour and break-out during smaller flood events.

For large flood events up to the 1-in-100 year flood event the overall mine design measures to reduce the impacts on shallow alluvials have in turn reduced the impacts of major flood events. That is, the reduction of panel width and extraction height also reduced the level of vertical movement on the floodplain, thereby reducing the overall flood impacts.

## 3.15 CONSTRUCTION

A total three year construction program has been developed covering the three separate construction sites: Tooheys Road Site, Buttonderry Site and (later) the Western Shaft site. Some construction activity (such as subsurface excavation for the drift) may continue over 24 hours as described below.

### **3.15.1 Tooheys Road Site**

Construction elements for the Tooheys Road Site are described further below and include:

- Decline tunnel (Drift);
- Civil infrastructure (roads, drainage, stockpile pads, erosion protection safeguards, etc);
- Rail loop and spur (up to 12 months duration);
- Administration buildings and facilities;
- Gas management facilities; and
- Mine operations dam and water treatment plant.

#### ***Decline Tunnel (Drift)***

The decline tunnel (or drift) will be an approximately 3,570 m long inclined mine access tunnel with a width of 6.5 m and a height of 6 m with a shallow curved roof. It will lead from the surface mine infrastructure area in the south-west corner of the Tooheys Road Site down to the mine seam at a depth of over 350 m below ground at the Buttonderry Site. The gradient of the decline will be 1 in 10 and the horizontal alignment is straight.

Construction of the decline could be expected to start as early as Year 1 and will be carried out over an 80 week timeframe in sequential stages comprising:

- Portal box cut;
- Construction of portal structure; and
- Drift excavation.

The majority of surface disturbance will occur during the first stage.

#### ***Tooheys Road Infrastructure***

The remaining Tooheys Road Site construction works relate to the coal handling infrastructure and buildings. Construction of the civil works will include:

- Raw coal stockpile pad, reclaim tunnel and associated pollution control dam;
- Product coal stockpile pad, reclaim tunnel and associated pollution control dam; and
- Internal access roads, sedimentation ponds and culverts, and other drainage controls.

#### ***Rail Loop and Spur***

The proposed alignment will have the following principal features:

- 1,700 m single track spur line that will follow the northern edge of a cleared easement for a 330kV overhead power line;
- 4,300 m balloon loop will operate in a clockwise direction to enable two train lengths to be accommodated before the loader and a single train length to be located after;
- Coal loading bin will be located on the western side of the balloon loop in cutting;
- Two rail underbridges will be built beneath Tooheys Road; and

- Four culverts will be built to accommodate creek crossings.

The entire construction program for the rail loop and spur is expected to take up to 12 months.

### 3.15.2 Buttonderry Site

Construction elements for the Buttonderry Road site can be split into the following groups:

- Shaft construction;
- Pit top facilities and associated infrastructure;
- Upgrade of the existing power supply and high voltage power and other services to the site; and
- Construction of power cabling and telecommunications to link Buttonderry Site and Tooheys Road Site.

The overall duration for the construction works at the Buttonderry Site is anticipated to be approximately two years. There are two ventilation shafts proposed at the Buttonderry Site and a ballast hole. The sizes of these shafts are described below (note dimensions and depths are subject to detailed design):

- Downcast ventilation shaft – 8 m diameter, approximately 350 m deep;
- Upcast ventilation shaft – 6 m diameter, 350 m deep; and
- Ballast hole – 0.9 m diameter, 350 m deep.

Following the completion of the upcast shaft the exhaust fan will be installed. A winder car motor room and staging area will be constructed around the downcast ventilation shaft.

### 3.15.3 Western Shaft

The western shaft will be 5 m in diameter and 485 m deep. It will act as the air intake for the western section of the mine and will serve as a secondary means of emergency egress for underground personnel. The site may also include a number of small diameter boreholes required to provide essential services to the underground mining operations. These services may include compressed air, communications, electrical power, concrete, ballast, and a dewatering main.

The shaft will not be required for the first 10 years of mine life. Construction will be carried out over around 60 weeks in the following stages:

- Stage 1: Partial upgrade of Brothers Forest Road;
- Stage 2: Construction of 5 m diameter 485 m deep concrete lined ventilation shaft; and
- Stage 3: Installation of car winder and erection of associated buildings.

### 3.15.4 Construction Costs and Manning

The development cost for the Project is estimated to be \$750 million. Up to an estimated \$613 million of these initial expenditures could occur in the Central Coast region. Construction phase workforce estimates for direct and flow-on employment are shown in **Table 5**.

**Table 5**  
**Construction Phase Workforce**

Year	Direct Jobs	Flow-on Jobs	Total Jobs
Year 1	1,001	807	1,808
Year 2	1,188	820	2,007
Year 3	801	509	1,309

*Source: Central Coast Research Foundation, 2008*

### **3.16 PROJECT ALTERNATIVES**

Since the granting of the WACJV Mining Authorities, an extensive exploration program and detailed feasibility studies have been carried out in order to identify the most efficient and environmentally responsible mining operation possible to extract the coal reserves. This process included the consideration of numerous mine plans and operational alternatives.

The primary objective of the studies was to develop a mine plan that considered the principles of Ecologically Sustainable Development (ESD), minimised potential environmental and social impacts whilst maximising coal recovery and retaining flexibilities going forward. The various Project alternatives that were considered during this process are described below.

#### **3.16.1 Option 1 – Do Nothing**

The do nothing and leave approach would result in the termination of the WACJV Mining Authorities which would then be relinquished to the NSW Government. This would result locally in a loss of employment opportunities and socio-economic benefits in addition to a loss of benefits and royalties or other payments to both the Federal and NSW State Government.

This alternative failed to maximise resource recovery and therefore was not considered to be in satisfaction of the Objects of the EP&A Act to encourage the proper development of natural resources for the purpose of promoting the social and economic welfare of the community.

In addition to the above, at this stage of the Development, to do nothing and leave would result in significant financial loss to WACJV as a result of investment in mine planning and environmental studies carried out to date.

#### **3.16.2 Option 2 – Underground Operation (Bord and Pillar)**

Option 2 involved the development of an underground mining operation utilising the bord and pillar underground mining method. This method has been investigated and deemed unviable for extraction of a large resource due safety implications. This mining method would result in a large portion of the resource being sterilised.

#### **3.16.3 Option 3 – The Project**

The preferred alternative is the Project as it is proposed, a 28 year underground longwall mining operation within the total defined Extraction Area. It will maximise the social and economic benefits from the Development whilst minimising impacts on environmental aspects such as surface water regimes and water supply, ecology, Aboriginal archaeology, and soils. This option was considered to be the best alternative in terms of meeting the principles of ESD and the Objects of the EP&A Act.

## 4 REGULATORY FRAMEWORK

This section sets out the planning and environmental regulatory framework applicable to the Project, including the identification of relevant strategic planning documents, environmental planning instruments and key development standards. Both NSW and Commonwealth legislation are identified.

### 4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

#### 4.1.1 Application of Division 4.1 in Part 4 of the EP&A Act

Upon the repeal of Part 3A of the EP&A Act on 1 October 2011, the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* inserted a new Division 4.1 in Part 4 of the EP&A Act. This Division provides for a new planning assessment and determination regime for State significant development (SSD).

Under section 89C of the EP&A Act, development will be SSD if it is declared to be such by the new *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Clause 8(1) of the SRD SEPP provides:

**“8 Declaration of State significant development: section 89C**

- (1) *Development is declared to be State significant development for the purposes of the Act if:*
- (a) *the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
  - (b) *the development is specified in Schedule 1 or 2.”*

The Project is SSD as it meets each of the two limbs in clause 8(1) of the SRD SEPP – that is:

- The Project is permissible with Development Consent on the land on which the Project will be carried out; and
- The Project is development that is specified in Schedule 1 to the SRD SEPP.

Each limb is briefly discussed below.

#### 4.1.2 Permissibility of the Project

Clause 7(1) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) provides:

**“7 Development Permissible with Consent**

(1) **Mining**

*Development for any of the following purposes may be carried out only with development consent:*

- (a) *underground mining carried out on any land ...”*

The Mining SEPP applies to the whole of NSW and pursuant to clause 5(3) of the Mining SEPP, prevails over any other environmental planning instrument to the extent of any inconsistency. The practical effect of clause 5(3) is that if there is any inconsistency between the provisions in the Mining SEPP and those contained any other environmental planning instrument, including relevantly the *Wyong Local Environmental Plan 1991* (Wyong LEP), the provisions of the Mining SEPP will prevail.

"Underground mining" is defined for the purposes of the Mining SEPP as follows:

***"underground mining means:***

- (a) *mining carried out beneath the earth's surface, including bord and pillar mining, longwall mining, top-level caving, sub-level caving and auger mining, and*
  - (b) *shafts, drill holes, gas and water drainage works, surface rehabilitation works and access pits associated with that mining (whether carried out on or beneath the earth's surface),*
- but does not include open cut mining."*

And further, "mining" is defined for the purposes of the Mining SEPP as follows:

***"mining means the winning or removal of materials by methods such as excavating, dredging, or tunnelling for the purpose of obtaining minerals, and includes:***

- (a) *the construction, operation and decommissioning of associated works, and*
- (b) *the stockpiling, processing, treatment and transportation of materials extracted, and*
- (c) *the rehabilitation of land affected by mining."*

Accordingly, because the Project in its entirety can be characterised as development for the purpose of "underground mining" (which incorporates in its definition the defined term "mining"), the Project is permissible with Development Consent on all of the land on which the Project will be carried out.

#### **4.1.3 The Project is development specified in Schedule 1 to the SRD SEPP**

The Project is development specified in Schedule 1 to the SRD SEPP.

Clause 5(1)(a) in Schedule 1 to the SRD SEPP specifies the following development:

##### ***"5 Mining***

- (1) *Development for the purpose of mining that:*
  - (a) *is coal ... mining, or ..."*

Given that the Project in its entirety is development for the purpose of coal mining, the Project is development specified in Schedule 1 to the SRD SEPP.

#### **4.1.4 The Project is State Significant Development**

As each of the two limbs in clause 8(1) of the SRD SEPP can be satisfied (see **Section 4.1.2** and **4.1.3**), the Project is declared to be SSD. As a consequence of this declaration, the Minister for Planning and Infrastructure (Minister) is the consent authority for the Project (EP&A Act, section 89D(1)).

The Minister has delegated his consent authority function for certain SSD, relevantly:

- To the NSW Planning Assessment Commission (PAC) for development applications made by private proponents for SSD; and
- To officers of the DP&I for development applications which have attracted less than 25 public submissions objecting to the development and where the local council (WSC) has not objected.

#### **4.1.5 Application of Other Provisions of the EP&A Act**

The other applicable provisions of the EP&A Act are described below.

##### ***Section 5 – objects of the EP&A Act***

The Wallarah 2 EIS will outline how the Project addresses the objects of the EP&A Act. This relevantly includes:

- The encouragement of the proper management of natural resources, including minerals, for the purpose of promoting the social and economic welfare of the community; and
- The encouragement of ecologically sustainable development.

##### ***Divisions 6 and 6A***

Divisions 6 and 6A of the EP&A Act relate to contributions and affordable housing provisions.

##### ***Section 89J***

Section 89J of the EP&A Act provides that the following authorisations are not required for the Project if it is approved SSD:

- The concurrence of the Minister administering Part 3 of the *Coastal Protection Act 1979*;
- A permit under sections 201, 205 or 219 of the *Fisheries Management Act 1994* (Fisheries Act);
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*;
- An Aboriginal heritage impact permit under the *National Parks and Wildlife Act 1974*;
- An authorisation under section 12 of the *Native Vegetation Act 2003*;
- A bush fire safety authority under section 100B of the *Rural Fires Act 1997*; and
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000* (WM Act).

## **Section 89K**

Section 89K of the EP&A Act provides that the following authorisations cannot be refused if they are necessary for the carrying out of the Project if it is approved SSD and that the authorisations granted must be substantially consistent with the Project's SSD Development Consent:

- An aquaculture permit under section 144 of the Fisheries Act;
- An approval under section 15 of the MSC Act;
- A mining lease under the *Mining Act 1992* (Mining Act);
- A production lease under the *Petroleum (Onshore) Act 1991*;
- An Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act);
- A consent under section 138 of the *Roads Act 1993* (Roads Act); and
- A licence under the *Pipelines Act 1967*.

## **4.2 NSW ENVIRONMENTAL PLANNING INSTRUMENTS**

### **4.2.1 State Environmental Planning Policies**

A number of State Environmental Planning Policies could apply to the Project - they are identified below.

#### **SRD SEPP**

The application of the SRD SEPP to the Project has already been discussed in **Sections 4.1.2** and **Section 4.1.3** above.

#### **Mining SEPP**

The application of the Mining SEPP to the Project is discussed in **Section 4.1.2** above. Further, clauses 12, 13, 14, 15, 16 and 17 of the Mining SEPP set out matters that the Minister must consider before determining the development application for the Project. These matters will be considered in the Wallarah 2 EIS.

#### **State Environmental Planning Policy (Infrastructure) 2007**

Clause 45 of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is relevant if the Project involves the penetration of ground within 2 m of an underground electricity power line or an electricity distribution pole, or within 10 m of any part of an electricity tower. It will also be relevant if the Project is within or immediately adjacent to an easement for electricity purposes, an electricity substation or within 5 m of an overhead electricity power line.

If clause 45 applies, the Minister must give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks and take into consideration any response to the notice that is received within 21 days of the notice being given.



### **State Environmental Planning Policy No 14 – Coastal Wetlands**

*State Environmental Planning Policy No 14 – Coastal Wetlands* (Wetlands SEPP) applies to the Wyong LGA, however its provisions which require the concurrence of the Director-General of the DP&I is not applicable to the Project because it is "*State significant development*" (EP&A Act, section 79B(2A)).

### **State Environmental Planning Policy No 33 (Hazardous and Offensive Development)**

For development that is a "*potentially hazardous industry*", clause 12 of the *State Environmental Planning Policy No 33 (Hazardous and Offensive Development)* (Hazardous SEPP) requires the preparation of a Preliminary Hazard Analysis. Further, for development that is a "*potentially hazardous industry*" or "*potentially offensive industry*", clause 13 of the Hazardous SEPP sets out matters that the Minister must consider in determining the development application for the Project.

If required, a Preliminary Hazard Analysis will be carried out in relation to the Project for inclusion in the Wallarah 2 EIS and the matters in clause 13 of the Hazardous SEPP will be considered in the Wallarah 2 EIS.

### **State Environmental Planning Policy No 44 - Koala Habitat Protection**

*State Environmental Planning Policy No 44 - Koala Habitat Protection* (Koala SEPP) applies to the Project because Wyong is a local government area specified in Schedule 1 to the Koala SEPP as being land subject to the Koala SEPP. The Koala SEPP requires a council (WSC), before determining a development application, to consider whether the land is "*potential koala habitat*", and if so, where it is "*core koala habitat*".

If the land is "*core koala habitat*", then the council must not grant consent unless a "*plan of management*" has been prepared and must also take into account the guidelines made under the Koala SEPP. Although it is the Minister (and not Council) that is the consent authority for the Project, the Wallarah 2 EIS will include an assessment of koala habitat within the Project Boundary for the purposes of the Koala SEPP.

### **State Environmental Planning Policy No 55 (Remediation of Land)**

*State Environmental Planning Policy No 55 (Remediation of Land)* (Contamination SEPP) provides that the Minister must not consent to the carrying out of the Project unless it has considered certain matters relating to whether or not the Project land is contaminated.

Further, given that the Project will involve a "*change of use*" of the Project land, the Minister may need to consider a "*preliminary investigation*" of the Project land and whether it satisfies certain criteria set out in clause 7(4) of the Contamination SEPP. The relevant provisions of the Contamination SEPP will be addressed in the EIS.

### **State Environmental Planning Policy No 71 – Coastal Protection**

It appears that a small part of the Project (comprising part of the Tooheys Road Site) is within the coastal zone to which *State Environmental Planning Policy No 71 – Coastal Protection* (Coastal Protection SEPP) applies.

Clause 8 of the Coastal Protection SEPP sets out matters that the Minister is to take into account when determining the development application for the Project in respect of that part of the Project within the coastal zone. There are also controls the Minister is to consider set out in Part 4 of the Coastal Protection SEPP. These provisions will be considered in the Wallarah 2 EIS.

#### **4.2.2 Local Environmental Plans**

##### ***Wyong Local Environment Plan 1991***

The Project is wholly located within the Wyong LGA. The local environmental planning instrument governing land use in the Wyong LGA is the Wyong LEP.

The Tooheys Road Site, containing the rail loop and spur line and the coal handling facilities is primarily zoned 4(e) Regional Industrial and Employment Development, with a small area that will not form part of the Project area zoned 7(g) Wetlands Management. Under the Wyong LEP, mining is permissible in the 4(e) zone but prohibited in the 7(g) area.

The Buttonderry Site will provide the main ventilation fans, and access for personnel and services. This site is zoned 1(c) Rural Holdings where development ancillary to mining is permitted with Development Consent.

This site is bordered to the north by 5(a) Waste Disposal, 10(a) Investigation Zone to the east (in the process of being zoned industrial), to the west by rural residential areas zoned 7(b) Scenic Protection, and to the south by areas zoned 6(a) Open Space Recreation, 7(a) Conservation and 7(c) Scenic Protection: Small Holdings.

There are several small areas within the underground extraction area which are zoned 6(a) Open Space Recreation or similar where mining is prohibited.

As discussed in **Section 4.1.1** above, due to the application of the Mining SEPP, to the extent that the Project is prohibited under the Wyong LEP, the Mining SEPP will prevail such that the Project in those areas is in fact permissible with consent.

The Wyong LEP also contains the following provisions:

- WSC must not grant consent to the carrying out of development on land to which the Wyong LEP applies unless, in the opinion of WSC, the proposed development is compatible with the objectives of the zone within which the development is proposed to be carried out; and
- Part 3 of the Wyong LEP contains a number of special provisions which apply to the decision-making function of WSC under the Wyong LEP.

The Minister (not WSC) is the consent authority for the Project. Notwithstanding, the abovementioned provisions of the Wyong LEP, insofar as they are relevant to the Project, will be considered in the Wallarah 2 EIS.

Further, the provisions will be considered having regard to the application of clause 8 of the Mining SEPP which provides:

**“8 Determination of permissibility under local environmental plans**

- (1) *If a local environmental plan provides that development for the purposes of mining, petroleum production or extractive industry may be carried out on land with development consent if provisions of the plan are satisfied:*
  - (a) *development for that purpose may be carried out on that land with development consent without those provisions having to be satisfied, and*
  - (b) *those provisions have no effect in determining whether or not development for that purpose may be carried out on that land or on the determination of a development application for consent to carry out development for that purpose on that land.*
- (2) *Without limiting subclause (1), if a local environmental plan provides that development for the purposes of mining, petroleum production or extractive industry may be carried out on land with development consent if the consent authority is satisfied as to certain matters specified in the plan, development for that purpose may be carried out on that land with development consent without the consent authority having to be satisfied as to those specified matters.”*

#### **4.3 STRATEGIC PLANNING DOCUMENTS**

##### **4.3.1 Central Coast Regional Strategy and the Draft North Wyong Structure Plan**

The Project is demonstrably consistent with the NSW Government's Central Coast Regional Strategy (CCRS) and the Draft North Wyong Structure Plan (Draft NWSP).

The CCRS was developed by the State government to assist in planning for an anticipated population growth in the region of 100,000 people by 2031, increased from 64,250 expected in the Draft CCRS. The majority of the population growth will occur in the Wyong Shire. The Strategy supports creating the capacity for over 45,000 jobs in the region over the next 25 years. Some 12,000 jobs are expected to occur in the NWSP area which includes the WEZ and Warnervale Town Centre, both designated as SSD Projects.

The NWSP area will be the focus of future employment lands releases, including in the Tooheys Road - Bushells Ridge precinct which was designated for development in the short term (including the Tooheys Road Site) in DP&I's Draft NWSP report of November 2010.

The Tooheys Road Site was zoned industrial more than 15 years ago by the NSW State Government as a significant regional employment precinct. The CCRS retains and reinforces this location as key employment land, although with some constraints. These constraints include management of vegetation and surface drainage systems which have been addressed by the Project and involved Project of protection measures that have been incorporated into the design.

The Project is consistent with the aims of the CCRS and NWSP in providing additional employment in the region, as it will generate around 300 new jobs directly, and provide additional employment opportunities for around 750 people through increased expenditure and well understood flow-on effects in the local and regional economies.

The Strategy also recognises that the region's employment growth is significantly driven by the resource base attracting investment in agriculture, mining and energy sectors.

These documents will be further addressed in the Wallarah 2 EIS.

#### **4.3.2 NSW Coastal Policy 1997**

The *NSW Coastal Policy 1997* (Coastal Policy) sets the context in providing for population growth and economic development at the same time as protecting the natural, cultural, spiritual and heritage values of the coastal environment. As stated in **Section 4.2.1**, a small part of the Project (comprising part of the Tooheys Road Site) is within the coastal zone.

The Coastal Policy will be addressed in the Wallarah 2 EIS.

#### **4.3.3 Strategic Review into the Impacts of Potential Underground Coal Mining in the Wyong LGA**

On 5 February 2007, the Minister appointed members to an independent strategic panel to inquire into potential coal mining development in the Wyong LGA, including the Dooralong and Yarramalong Valleys. The panel's terms of reference were to examine and report on:

- "1. Whether coal mining under the catchment for the Mardi Dam, would compromise, in any significant way, the water supply of the Central Coast;*
- 2. Environmental impacts of any underground coal mining, with a particular emphasis on:*
  - surface and groundwater resources, especially on drinking;*
  - water supply and flooding;*
  - hazards and risks of subsidence impacts; and*
  - the amenity of the community, including dust and noise impacts;*
- 3. Social and economic significance of any underground coal mining to the local community, the region and State; and*
- 4. Areas where mining should not be permitted, or if permitted the conditions under which it may proceed, having regard to the matters listed above and the NSW Government's strategic planning policies that apply to the area."*

The panel's final report was released on 17 December 2008. The findings and recommendations in the panel's report will be addressed in the Wallarah 2 EIS.

#### **4.3.4 Action Plan for the Hunter-Central Rivers Catchment Management Authority**

The Catchment Action Plan (CAP) for the Hunter-Central Rivers Catchment Management Authority (CMA) region is prepared under the *Catchment Management Authorities Act 2003*. The CAP addresses mining and extractive industries and includes a number of policy statements with regard to the impacts of these activities on natural resources within the Hunter-Central Rivers CMA region. These policy statements will be addressed in the Wallarah 2 EIS.

#### **4.3.5 Strategic Regional Land Use Plans**

The NSW Government's Strategic Regional Land Use Policy was released prior to the March 2011 State election and has as its focus the prioritisation of "*strategic agricultural land*" and "*associated water*" to guarantee food security.

The NSW Government is developing Strategic Land Use Plans intended to identify, on a regional basis, the areas suitable for agriculture, mining, coal seam gas extraction, conservation, urban development and other types of land use. If a draft or final plan for the Project's region is publicly released during the preparation of the application, it will be considered in the Wallarah 2 EIS. Further, an Agricultural Impact Assessment will be completed for the Project in accordance with DP&I's Draft Strategic Regional Land Use Policy Guideline for Agricultural Impact Statement (DP&I 2011).

### **4.4 OTHER LEGISLATION POTENTIALLY APPLICABLE TO THE PROJECT**

The Project may require approvals under one or more of the following NSW legislation:

- *Contaminated Land Management Act 1997*;
- *Crown Lands Act 1989*;
- *Dams Safety Act 1978*;
- *Dangerous Goods (Road and Rail Transport) Act 2008*;
- *Forestry Act 1916* (Forestry Act);
- *Mining Act*;
- *Petroleum (Onshore) Act 1991*;
- MSC Act;
- *Noxious Weeds Act 1993*;
- *Roads Act*;
- POEO Act;
- *Water Act 1912* (Water Act); and
- WM Act.

The likely application of the Mining Act, POEO Act, Forestry Act, Water Act and the WM Act are briefly identified below.

#### 4.4.1 Mining Act

Applications have been lodged with the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) for mining leases for the Extraction Area and the surface facilities within the Project Boundary. These are Mining Lease Application (MLA) 342, MLA 343, MLA 346 and MLA 350.

#### 4.4.2 POEO Act

An EPL will be sought for the Project under the POEO Act.

#### 4.4.3 Forestry Act

For any component of the Project that will occur within the Wyong State Forest, the WACJV will apply for an occupation permit under section 31 of the Forestry Act.

#### 4.4.4 Water Act 1912 and Water Management Act 2000

##### **Water Access Licences**

The Project's potential requirement for Water Access Licences (WALs) under Part 2 of Chapter 3 of the WM Act depends on whether a Water Sharing Plan (WSP) has commenced in respect of the water sources within the Project Boundary. The following surface WSPs apply to the Project:

- The *Water Sharing Plan for the Jilliby Jilliby Creek Water Source 2003* (JJCW WSP) – which commenced on 1 July 2004; and
- The *Water Sharing Plan for the Central Coast Unregulated Water Sources 2009* (CCUWS WSP) – which commenced on 1 August 2009.

Clause 5 of the JJCW WSP provides that it applies to all water occurring on the land surface shown on the map in Schedule 2 to the JJCW WSP, including all rivers, lakes and wetlands, but excludes all water contained within the aquifers underlying this water source.

Clause 4 of the CCUWS WSP provides that it applies to a range of water sources (relevant to the Project is the Wyong River Water Source), and those water sources include all water occurring naturally on the surface of the ground shown on the registered plan for the water sources and all water in rivers, lakes and wetlands in these water sources. They do not include water contained in alluvial sediments, coastal sands, fractured rock aquifers and basement rocks. Accordingly, as no WSP has commenced in respect of the groundwater within the Project Boundary, the Water Act remains the relevant legislation in respect of the licensing of groundwater extraction within the Project Boundary.

Appropriate WALs for the Project's taking of water from the water sources the subject of the abovementioned WSPs would be obtained under the WM Act and appropriate bore licences under the Water Act would be obtained for the Project's extraction of any groundwater.

It is noted that pursuant to section 113A of the Water Act, part of the Project Boundary is the subject of an embargo on applications for bore licences under Part 5 of the Water Act. The embargo, known as the *Central Floodplain Alluvial Groundwater Sources and Highly Connected Alluvial Groundwater Sources of Coastal Catchments – Regional NSW* embargo, was gazetted on 11 April 2008.

It applies to:

- All the groundwater found in alluvial aquifers located upstream of the tidal limit, and within 500 m of a 3<sup>rd</sup> order stream or greater, in the relevant part of the Project Boundary to which the embargo applies; and
- All the groundwater found in alluvial aquifers located downstream of the tidal limit in the relevant part of the Project Boundary to which the embargo applies.

### **Water Approvals**

As discussed in **Section 4.1.2** above, if the Project is granted Development Consent, by the operation of section 89J of the EP&A Act, it will not require water use approvals under section 89 of the WM Act, water management approvals under section 90 of the WM Act or a controlled activity approval under section 91 of the WM Act. The Project will have to obtain, if required, an aquifer interference approval under section 91 of the WM Act.

## **4.5 COMMONWEALTH LEGISLATION**

### **4.5.1 Environment Protection & Biodiversity Conservation Act 1999**

The *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas of national significance. It also provides a mechanism for national environment protection and biodiversity conservation.

The EPBC Act is administered by Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) and provides protection for listed Matters of National Environmental Significance (MNES) including:

- Listed species and communities (e.g. listed Threatened species and ecological communities and migratory species);
- Protected areas (e.g. World heritage properties, Ramsar wetlands of international significance, conservation zones); and
- National, Commonwealth and Indigenous Heritage.

The EPBC Act contains an assessment and approval process for proposed actions which are a "*controlled action*" because it will have, or is likely to have, a significant impact on a MNES. A delegate of the Federal Minister decided on 21 December 2007 that the Project is a "*controlled action*" because it is likely to have a significant impact on listed Threatened species and communities.

On 23 September 2010, the Federal Minister's delegate also decided that the Project will be assessed by accredited assessment under Part 3A of the EP&A Act. Consultation will be undertaken with SEWPaC to confirm that the Project's assessment under Division 4.1 in Part 4 of the EP&A Act can be the Project's accredited assessment process under the EPBC Act given the repeal of Part 3A.

## 5 STAKEHOLDER ENGAGEMENT

This section includes a description of WACJV's stakeholder engagement undertaken for the Project to date and a summary of the key consultation activities proposed for the Wallarrah 2 EIS.

### 5.1 INTRODUCTION

Community consultation has formed an integral part of the planning process for the Project and commenced at the awarding of the WACJV Mining Authorities. The community consultation model was developed, consistently reviewed and adjusted according to change in community interests, outcomes from exploration and mine planning along with upgrading and changes to local and regional planning instruments.

The model used throughout consultation and communication has been to:

- Establish objectives of community consultation;
- Identify stakeholders;
- Identify stakeholder issues;
- Assess and evaluate stakeholder issues;
- Create engagement techniques to address those issues appropriately;
- Engage with stakeholders and the wider community; and
- Review consultation effectiveness and adjust appropriately for further engagement.

WACJV has identified key community, regulatory and industry stakeholders relevant to the Project and will continue to endeavour to build strong and effective relationships, consistent with their policies and values.

### 5.2 EXISTING COMPANY ENGAGEMENT

Since the granting of its exploration licences, WACJV has been undertaking active stakeholder engagement on the Development. This includes the establishment of a local office in Wyong commercial district and later at Tuggerah and a website dedicated to the Project. The Wyong office consolidated with the Tuggerah office when the opportunity arose.

To date, there have been in excess of 300 separate meetings with landowners and meetings with Government Agencies. Presentations have also been delivered to community and Non-Government Organisations regarding progress of the Project.

WACJV has also been actively engaging with the local community on the Project through the Community Liaison Committee (CLC), newsletters, local media, community surveys, open day, business stakeholder briefings, sponsorships, and information kits to any interested party. In this regard, WACJV has incorporated community feedback into the final mine plan. Further opportunities will be provided to stakeholders throughout the Wallarrah 2 EIS process to provide input into the Project. A summary of the stakeholder engagement activities undertaken to date is presented in **Table 6**.



**Table 6**  
**Stakeholder Engagement Activities to Date**

Activity	Details
Stakeholder Engagement and Communications	<ul style="list-style-type: none"> <li>• CLC Meetings</li> <li>• Project Newsletters/ Updates</li> <li>• State and Local Government briefings and meetings</li> <li>• Public Meetings</li> <li>• Community Information Sessions</li> <li>• Community and NGO presentations</li> <li>• Media Briefings</li> <li>• Website updates</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• Near neighbour meetings/ presentations</li> <li>• Community and NGO meetings / presentations</li> <li>• Website forms</li> </ul>
Community Support and Assistance	<ul style="list-style-type: none"> <li>• Dooralong Bush Fire Brigade</li> <li>• Yarramalong Bush Fire Brigade</li> <li>• Volunteer Fire Fighters Association</li> <li>• Jiliby Public School</li> <li>• Wyong Chamber of Commerce</li> <li>• Dooralong Public School</li> <li>• Wyong High School (Streamwatch)</li> <li>• Wyong High School (annual excellence awards) Combined Churches Carols</li> <li>• Chittaway Public School</li> <li>• Budgewoi Public School</li> <li>• Lakes Grammar School</li> <li>• Burnside Homes</li> <li>• Salvation Army – Oasis Youth Project, sound recording studio, Wyong</li> <li>• Wyong Arts Festival</li> <li>• Northern Lakes Family Centre</li> <li>• Central Coast Area Health</li> <li>• Newcastle and Hunter Youth Project Trust</li> <li>• Sports teams and clubs – e.g. Toukley Sailing Club, Central Coast Aboriginal Pelicans, Caves Beach SLSC</li> <li>• Sponsorship of community services announcements (2GO SEAFM)</li> </ul>

### 5.3 PROJECT ENGAGEMENT

The objectives of all Project engagement are:

- To establish WACJV credentials;
- To establish open communication channels with the community;
- To inform;
- To listen; and
- To respond.

Relationships have been established and will continue to be developed with key stakeholders during the preparation of the EIS. WACJV will facilitate stakeholder feedback on the Project to ensure that stakeholder issues are adequately addressed through the Social Impact Assessment and EIS.

Relevant engagement methods which will be undertaken for different stakeholder groups are summarised in **Table 7** and discussed further below.

**Table 7**  
**Stakeholder Communication Methods**

Stakeholders	Method
Government Agencies (DP&I, Division of Resources and Energy, NSW Office of Water, Office of Environment & Heritage, Roads and Traffic Authority, RailCorp, NSW Dept of Transport, NSW Health); Gosford-Wyong Councils' Water Authority; relevant infrastructure providers; Catchment Management Authority, WSC, SEWPaC)	<ul style="list-style-type: none"> <li>• Briefings and Meetings</li> <li>• Community Information Sheets</li> </ul>
Relevant State & Federal MPs	<ul style="list-style-type: none"> <li>• Briefings</li> <li>• Community Information Sheets</li> </ul>
Non-Government Organisations and Special Interest Groups	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Information sessions</li> <li>• Community Information Sheets</li> <li>• Community Reference Groups</li> <li>• Website feedback forms &amp; Project Information Line</li> </ul>
Individual Neighbours	<ul style="list-style-type: none"> <li>• Personal briefings</li> <li>• Community Information Sheets</li> <li>• Information sessions</li> <li>• Community Reference Groups</li> <li>• Website feedback forms &amp; Project Information Line</li> </ul>
Wider Community	<ul style="list-style-type: none"> <li>• CLC briefings</li> <li>• Community Information Sheets</li> <li>• Information sessions</li> <li>• Community Reference Groups</li> <li>• Website feedback forms &amp; Project Information Line</li> <li>• Newspaper notices / media releases</li> </ul>

Stakeholders	Method
Aboriginal Community	<ul style="list-style-type: none"> <li>• Presentations</li> <li>• Newspaper notices</li> <li>• Personal briefings</li> <li>• Community Information Sheets</li> <li>• Information sessions</li> <li>• Community Reference Groups</li> <li>• Website feedback forms &amp; Project Information Line</li> </ul>
Local Service Providers, business and industry associations	<ul style="list-style-type: none"> <li>• Personal meetings</li> <li>• Community Information Sheets</li> <li>• Website feedback forms &amp; Project Information Line</li> </ul>
Relevant Neighbouring mines and industry	<ul style="list-style-type: none"> <li>• Producers Meeting presentations and updates</li> <li>• Community Information Sheets</li> </ul>
Media	<ul style="list-style-type: none"> <li>• Personal briefings</li> <li>• Interviews</li> <li>• Advertisements</li> <li>• Press releases</li> </ul>

### 5.3.1 Regulatory Engagement

DP&I exhibited the W2CP EA from 10 March 2010 until 2 June 2010, and made a public commitment to accept late submissions. As at 31 January 2011, DP&I had received a total of 249 submissions on the W2CP, including:

- 11 from public authorities;
- Nine from special interest groups (Australian Coal Alliance, Newcastle Greens, Rivers SOS, Total Environment Centre, Climate Action Group Central Coast, Wyong Chamber of Commerce, Stop Korean Coal Mining Inc., United Mineworkers Association and the Jilliby Stage 2 Landowners Action Group); and
- 229 from the general public, including 54 form letters.

For the Wallarah 2 EIS, face-to-face briefings and group presentations to State and Local Government agencies will take place throughout the development of the Project. These presentations will be designed to provide Government stakeholders with an initial overview of the Project and to identify issues that will require assessment in the Wallarah 2 EIS.

### 5.3.2 Community Engagement

Key government agencies have also been involved in the consultation process and have received regular updates on community issues. There have been several beneficial outcomes from the consultation process which have led to modifications to the Project design in order to further reduce the impacts of the Project on the community and to assist in forming a Project that reflects community expectations.

A summary of the key consultation activities undertaken and proposed are as follows:

- 14 newsletters with factsheets distributed to the community that provided information on the progress of the Project and key environmental studies. Further newsletters are planned with the first intended to coincide with the Development Consent application;
- Public displays providing information and an opportunity for the community to provide feedback. Prior to the establishment of an office display area, displays were held at several public libraries and shopping centres;
- A telephone information line to provide an avenue for the public to seek information or provide comment. This has been superseded by the superior technology and information access provided by the Project website and email contact options;
- A dedicated website that provides information on the Project and an opportunity for the public to seek information or provide comment. The website has been revised and can be found at [www.wallerah.com.au](http://www.wallerah.com.au);
- Presentations of environmental studies to groups such as the CLC, Progress Associations, Precinct Committees, industry associations, supplier groups, conferences. Further presentations will be ongoing throughout the approval process;
- Community surveys that were distributed during community presentations and targeted surveys to obtain important information about the local community; and random telephone surveys of local businesses and residents. A community survey is scheduled for 2011;
- Publication and wide distribution of a DVD movie explaining the key aspects of the W2CP;
- Ongoing liaison with key stakeholder groups including government departments, Non-Government Organisations (NGOs), local government and local community groups; and
- Monitoring public comment, submissions and media coverage.

A CLC was established by Government upon issue of the original exploration licences. It was, and continues to be, independently chaired by The Hon Milton Morris AO. Members of the committee have included elected and officer members of WSC, representatives from the Mine Subsidence Board, I&I NSW (now DTIRIS – Division of Resources and Energy (DRE)), United Mineworkers Federation, Association of Mine Related Councils, and representatives from community groups such as the Tuggerah Lakes Catchment Management Committee, Tuggerah Lakes Estuary Management Committee, Central Coast Minestop and Australian Coal Alliance. The Committee met on a regular basis (and at times on an as-needed basis) during the planning and assessment of the Project. With the Project now centred on the western Project area and progressing through the approval phase, and with various organisations having been restructured, membership of the CLC has been revised and continues to be subject to review.

Community Consultation and feedback focussed on a number of matters important to the local community and as far back as October 2006 the company publicly announced its *Commitment to the Community*. That commitment said:

- The only mine plan that Project will submit to the NSW Government will be one that safeguards the surface and underground water regimes;

- The company will conduct its business in a manner that at all times respects the people of the Wyong community;
- The company considers the protection of the environment as an important part of its normal business activities;
- The company will conduct its business in a way that maintains a safe and healthy workplace for employees, visitors and the local community;
- The company will seek to source up to 70% of its 300 strong proposed workforce from the Central Coast and immediately adjacent regions and provide significant training for those new to mining; and
- The company will develop sustainable practices that contribute to the interests of the wider community.

## 6 PREVIOUS ENVIRONMENTAL ASSESSMENTS

An application was lodged by the proponent in November 2007 for the W2CP under Part 3A of the EP&A Act. The W2CP EA supported this application. The application was subject to a thorough assessment, including a review by the Planning Assessment Commission (PAC) at the direction of the then Minister for Planning. The PAC, following a public hearing, recommended approval in its November 2010 report. Under the previous NSW Government the PAC was not the determining authority for the Project, its function was to review the Project and make a recommendation to the (then) Department of Planning (DoP). The application was refused in the determination by the Minister on 3 March 2011, with several technical reasons provided for the refusal. The Instrument of Refusal is provided in **Appendix B**.

The status of the technical assessment areas for the W2CP up to the time of the Minister's determination is provided in a simplified form in **Table 8**. This tabulation summarises the findings of the Director-General's Environmental Assessment Report (DG EA Report) which provided recommendations to the Minister for his determination of the Project on 3 March 2010.

**Table 8** highlights the areas of environmental impact assessment to date that have been accepted by DP&I as meeting its assessment criteria. Those items ticked indicate where the Project has clearly demonstrated that no significant impacts will result and that there are no significant or uncertain residual environmental risks evident. Areas of environmental impact assessment which were considered, in the opinion of the Minister, to exhibit a degree of uncertainty and therefore an unresolved level of residual environmental risk are noted as yet to be finalised.

**Table 8**  
**Simplified Summary of Environmental Assessment Status to date**

Inquiries and Assessments	Status	Summary Comment
Strategic Inquiry into Mining in Wyong Area	✓	No significant reason why mining should not be permitted in the Wyong area
Wyong Water Study	✓	There is sufficient information for general assessment of mining
International Peer Review of the Wyong Water Study	✓	There is sufficient information for an assessment of the W2CP
Planning Assessment Commission report	✓	W2CP can be approved with appropriate conditions
Central Coast Water Supply	✓	"The Department considers the risk from the proposal to be minimal and manageable" (p 24 DG's EA Report)
Flooding	✓	The DoP supports the measures identified by the PAC as appropriate for the mitigation and management of subsidence-induced flooding impacts( p 24 DG's EA Report)

Inquiries and Assessments	Status	Summary Comment
Groundwater	✓	The PAC forms the view that shallow bores into alluvium would not be affected and those in hardrock only slightly and very slowly affected. (DG's EA Report )
Surface water quality management and water treatment at surface facilities sites	<b>To be finalised</b>	<i>"The Project does not adequately address potential surface water quality impacts resulting in uncertainty around the ability of the project to meet acceptable water quality outcomes."</i> (Instrument of Refusal )
Subsidence <ul style="list-style-type: none"> <li>Model</li> <li>Years 1- approx 20 (Hue Hue and Valley area)</li> <li>Years 21-42 (in forested western area)</li> </ul>	✓  ✓  <b>To be finalised</b>	Model characterised as current best practice. p 18 DG's EA Report The model has been appropriately calibrated and applied to the eastern, non-forested hills part of the mine plan. p 18 DG's EA Report Consideration of western, forested hills areas subject to additional information to provide reasonable level of confidence. (p 22 DG's EA Report) <i>"Uncertainty around the subsidence predictions for the project, particularly in the western portion of the site under Jilliby Conservation Area and the Wyong State Forest."</i> (Instrument of Refusal)
Ecology	<b>To be finalised</b>	PAC and DoP satisfied with assessment but require further assessment of offset lands although this matter was not regarded as fundamental to determining The acceptability of direct ecological impacts from the W2CP (p26 DG's EA Report) <i>"Uncertainty around the ecological impacts of the project, particularly in the western portion of the site, as a result of lack of ecological survey effort combined with uncertainty as to subsidence predictions in this area."</i> (Instrument of Refusal)
Heritage <ul style="list-style-type: none"> <li>Aboriginal</li> <li>Non-Aboriginal</li> </ul>	<b>To be finalised</b>  ✓	<i>"Uncertainty around the heritage impacts of the project, particularly in the western portion of the site, as a result of lack of heritage survey effort combined with uncertainty as to subsidence predictions in this area."</i> Instrument of Refusal The DoP considers this matter low risk and that any impacts could be conditioned to ensure appropriate mitigation measures. (p 28 DG's EA Report)
Air quality	✓	The DoP considers that the proposal can operate and comply with set air quality criteria during construction and operation. (p 29 DG's EA Report)
Noise	✓	The DoP concurs with PAC that noise impact assessment for day / evening / night periods demonstrates that noise can be adequately managed

It should be noted that although considerable areas of environmental impact assessment were deemed acceptable to DP&I and the PAC, the Wallarah 2 EIS will include updated technical assessments in consideration of contemporary guidelines and standards from the relevant regulatory authorities and any issues raised by regulatory or other stakeholders in the Project assessment process.



## 7 ENVIRONMENTAL RISK ASSESSMENT

Numerous risk reviews and assessments have been undertaken to ascertain priorities for environmental assessment and consideration of management requirements. The range of risk review information has been previously published in the Preliminary Assessment Report accompanying the November 2007 Project Application under Part 3A of the EP&A Act and presented in comprehensive detail in the W2CP EA.

However, to assist in identifying the key residual environmental and social issues associated with the Project, a revised environmental risk assessment was completed for this application utilising the WACJV Risk Assessment Tools. This risk assessment is presented in full in **Appendix A** and a summary is provided below in **Table 9**.

The potential environmental issues were ranked in accordance with the WACJV Risk Matrix as either being of low, medium, high or extreme risk (in the absence of controls). The initial findings of the risk assessment were used to prioritise and focus the required environmental assessments for the Project. Additionally, the findings of the risk assessment will ensure that appropriate management and mitigation options are developed and that each environmental issue is addressed to a relevant extent. The resulting scope of assessment to be included in the Wallarah 2 EIS is discussed in further detail in **Section 8**.

The majority of activities are rated as low or moderate level risks, with some high risks identified in the absence of controls. No extreme risks were identified. It is anticipated that with the completion of a detailed assessment as outlined in **Section 8**, any high risks will be reduced to medium or low, due to the identification and implementation of appropriate controls and mitigation measures.

**Table 9**  
**Summary of Environment Risk Assessment**

Category	Issues
Extreme	None
High	Subsidence, Ecology, Aboriginal Archaeology and Cultural Heritage, and Surface Water (including flooding, water balance, and sediment and erosion control)
Medium	Groundwater, Surface Water, Air Quality and Greenhouse, Noise, Traffic and Transport, Visual and Lighting, Social and Economics
Low	Bushfire, Hazard Analysis, Soils and Land Capability, Agriculture, Final Land and Rehabilitation, Final Land Use and Closure, Agricultural Impacts and Non-Aboriginal Heritage

## 8 KEY ENVIRONMENTAL AND COMMUNITY ISSUES

This section outlines the key environmental and community issues associated with the Project. Each is briefly discussed, with a particular focus on those issues itemised in the Instrument of Refusal which will be subject to additional investigation and assessment in the Wallarrah 2 EIS.

### 8.1 SUBSIDENCE

#### 8.1.1 Background

A Subsidence Modelling Study was completed for the W2CP by both Strata Control Technology Pty Limited and Mine Subsidence Engineering Consultants Pty Limited (MSEC) in conjunction with the W2CP EA study team. The combined use of these two leading consultants for the W2CP subsidence modelling study aimed to ensure the mine plan was adequately developed in consideration of minimisation of subsidence related impacts.

The mine plan has been formulated to reduce subsidence effects and associated impacts and consequences by incorporating reduced extraction heights and reduced longwall panel widths near sensitive and constrained areas. For example, the amount of coal to be extracted beneath the Hue Hue rural residential area has been significantly reduced to ensure that surface movement will comply with the levels required within the declared MSD. Houses designed and built in accordance with the Hue Hue MSD criteria should therefore be provided with appropriate levels of structural protection against the impacts of subsidence.

When underground mining occurs deep beneath the Dooralong Valley floodplain, which is necessary to access coal reserves within the surrounding State Forest, less coal will be extracted so as to reduce the subsidence effects and to ensure that shallow aquifers are appropriately protected and continue to remain effectively isolated from any deeper, poor quality aquifers within the bedrock.

The Hue Hue MSD, which overlies the initial mining zone of the Extraction Area, was proclaimed in 1985. The remaining Extraction Area lies within the Wyong MSD that was proclaimed in 1997.

The MSB (which is funded by a levy on the coal mining industry) will be responsible for the repair of any damage to surface structures, including houses, which arise from the effects of subsidence. The MSB is a service organisation operating for the community in coal mining areas of NSW, and is responsible for administering the *Mine Subsidence Compensation Act 1961*. As part of the ongoing approvals for the mining operation, detailed property inspections will be required for the individual Property Subsidence Management Plans that will be developed in consultation with each affected landowner. These plans will detail the existing condition of all surface structures within a property prior to subsidence occurring. On completion of coal extraction in the vicinity, properties would be re-inspected and if any damage is caused by the extraction of coal then it will be fully corrected at no cost to the landowner.

The current mine plan has provided for restricted panel widths of 120-175 m within the Hue Hue MSD and immediately adjacent areas. Not only have the panel widths and geometries been carefully designed, the proposed extraction height beneath the Hue Hue area has been significantly reduced to ensure that the final surface subsidence effects will comply with the aforementioned limits so as to enable the effective management of subsidence impacts on structures.

Similarly, when mining beneath the Dooralong Valley floodplain, the mine design has been selected to reduce the effects of vertical subsidence. In the case of the Yarramalong Valley, this risk has been substantially mitigated by shortening the length of the longwall blocks. The risk has been avoided in the case of the Wyong River by excluding longwall panels under or in immediate proximity to the river.

Also, the Project has shortened the longwall blocks in the vicinity of the confluence of Little Jilliby Creek with Jilliby Creek to avoid risks to stream stability.

### **8.1.2 Residual Matters**

In the DG EA Report, DP&I noted that it was generally satisfied that WACJV applied an appropriate subsidence prediction and assessment methodology and that I&I NSW (now DRE) considered the modelling methodology applied by the Proponent to be current best practice in NSW.

In the W2CP EA the subsidence assessment modelled a Hue Hue Case and a Valley Case to encompass the geological conditions within the Hue Hue MSD (in the north-east of the Extraction Area) and the alluvial valleys located across the site.

However, the DG EA Report noted that the mining and subsidence assessment in the forested hills area in the western part of the Extraction Area (west of LWN14 and LWS6) was not specifically modelled and calibrated with the IPM model as was done at these other two locations. DP&I therefore considered that there remains some degree of uncertainty about the subsidence behaviour in these upland areas which would limit the confidence in the assessment of the implications on surface environmental aspects in the area, in particular regarding ecology and heritage.

WACJV's risk assessment indicated that the key locations of concern were the Hue Hue and Dooralong Valley floodplain areas and hence the much deeper mining in the western part of the Extraction Area was routinely assessed without site specific modelling.

The PAC noted that mining is unlikely to reach this western forested hills area of the site for 12-15 years after commencement of the Project, and there is therefore sufficient time for the Proponent to undertake further assessment of the likely subsidence effects in this area, and to modify the Project if necessary. The PAC also highlights that the proposed adaptive management approach would enable subsidence data from the first 12-15 years of mining to be used to inform a more accurate subsidence model for the Project as a whole.

### 8.1.3 Assessment Methodology

The Wallarrah 2 EIS will ensure that matters raised by the DP&I and PAC reports and the Minister's determination will be addressed. This will involve a revised subsidence study and modelling being undertaken to extend the existing assessments contained in the W2CP EA.

The Wallarrah 2 EIS will include all material previously addressed in the W2CP EA specialist study including:

- Identification of potential risks and constraints associated with subsidence associated with the Project's longwall coal mining operations;
- Overview of the longwall extraction process;
- Consideration of the relevant geological, geotechnical and structural characteristics in the Project area;
- Modelling of subsidence behaviour using the empirically-based Incremental Profile Method (IPM) and numerical modelling of the specific Project area geology and rock behaviour / response in relation to subsidence;
- Consideration of and prediction of systematic (vertical subsidence, tilting and strains) and non-systematic (far field movements, upsidence and closure, rock mass disturbance) subsidence movements;
- Evaluation of alternative mine layouts in an iterative mine design process;
- Review of the relevant statutory context, including MSDs, subsidence criteria and guidelines, the role of the MSB and the legislation it administers, and the Subsidence Management Plan Process;
- Consideration of subsidence effects, impacts and consequences in the overall Project environmental assessment and the integration with other key environmental assessment areas such as groundwater, flooding, hydrogeomorphology and ecology;
- Assessment of impacts on houses, structures, other improvements, soils, steep areas and other natural features, roads, transmission lines, communication cables, other public infrastructure, etc;
- Rehabilitation and other management requirements; and
- Monitoring requirements, model validation and adaptive management.

To ensure that the additional certainty is provided for subsidence modelling and fuller consideration of the implications of subsidence on the known low risks in the forested hills area for ecological and heritage factors, WACJV will undertake the following additional assessment work as part of the Wallarrah 2 EIS:

- Develop “*Western Upland*” subsidence prediction case for the forested hills area beyond the LWN14 and LWS6 longwall panels, in consultation with geological, groundwater and other project specialists;
- This will be a newly developed numerical model grid whose profile will incorporate approximately 200 m of Triassic overburden and will address the currently proposed extraction geometry;
- Numerical simulations will be run;
- The output of the simulation will be reviewed and extraction geometry may be potentially revised;
- Further consultation throughout with geological, groundwater, heritage and ecological specialists as may be required;
- Re-run the numerical simulation, if required;
- Generate systematic subsidence predictions (i.e. surface subsidence, strains and tilts); and
- Generate non-systematic subsidence predictions (i.e. upsidence and closure).

The proposed mine plan will meet the guidelines associated with the Hue Hue and Wyong MSDs.

The additional modelling and assessment work will augment the existing state-of-the-art study and address all requirements of DP&I.

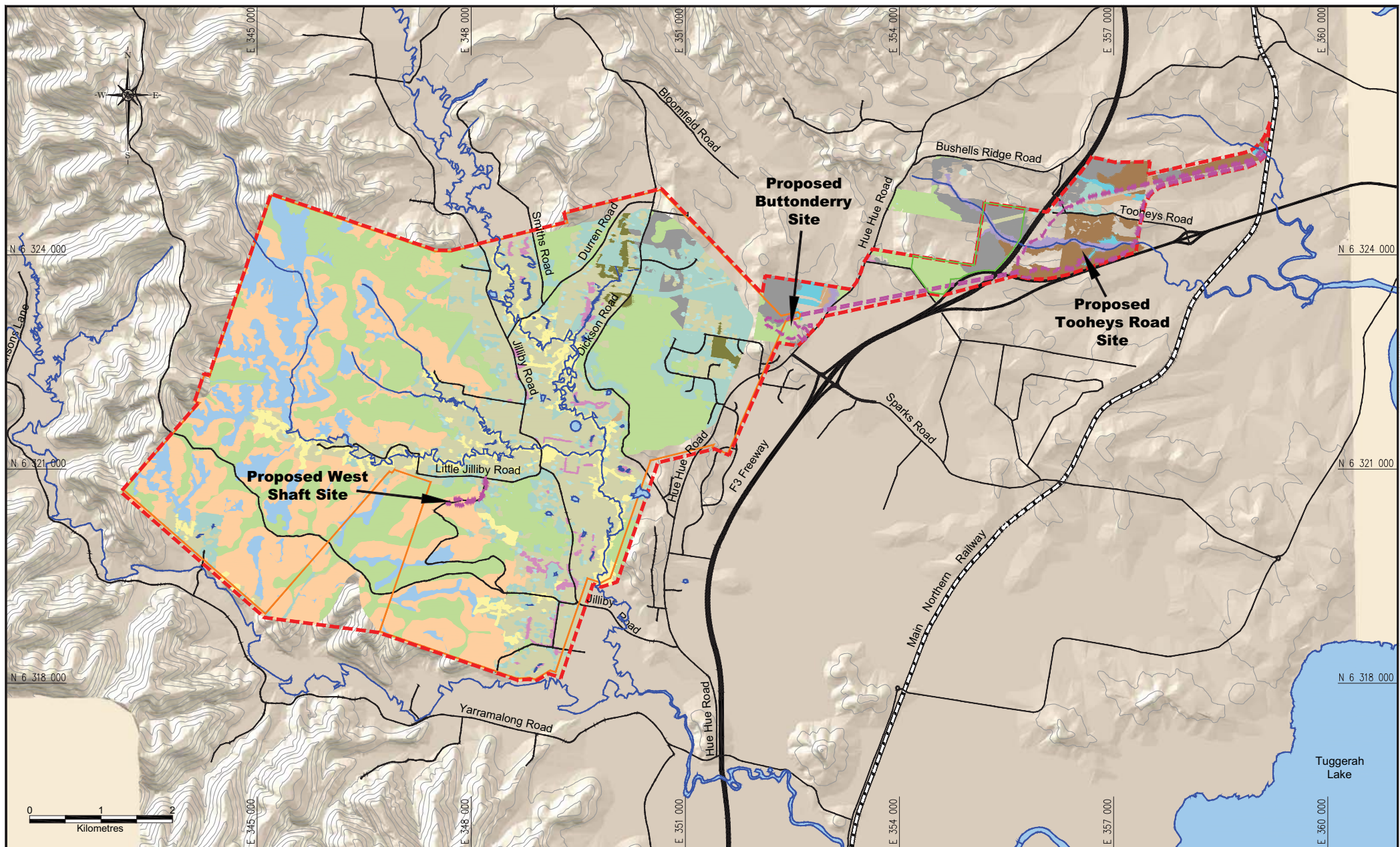
The subsidence data will be used in other relevant environmental studies such as the groundwater and surface water assessments, flooding, Archaeology and ecology.

## 8.2 ECOLOGY

### 8.2.1 Background

Several studies of flora and fauna were undertaken for the W2CP, including ecological and biodiversity impacts associated with the surface facilities and surface areas above the mining footprint. These are contained in the W2CP EA report and include reports by OzArk Environmental & Heritage Management (OzArk EHM) and ecologist Steven Bell. **Figure 11** demonstrates the vegetation communities within the Project Boundary.

Other recent environmental assessment reports associated with major infrastructure projects or planning studies impacting land owned by the company or within the Disturbance Boundary have also been reviewed (e.g. Munmorah Gas Turbine Facility, Morisset to Warnervale Water Trunk Main, Mardi-Mangrove Pipeline Project, North Wyong Structure Plan, etc).



- Project Boundary
- Indicative Infrastructure Boundary
- Roads
- Railway
- Waterways
- Extraction Area
- Offset Area
- Alluvial Floodplain Shrub Swamp Forest (EEC)
- Alluvial Redgum Footslope Forest (EEC)
- Alluvial Riparian Blackbutt Forest (EEC)

- Alluvial Woollybut-Melaleuca Sedge Forest
- Coastal Ranges Moist Layered Forest
- Dooralong Scribbly Gum Woodland
- Dooralong Spotted Gum-Ironbark Forest
- Narrabeen Alluvial Drainage Line Complex (EEC)
- Narrabeen Buttonderry Footslopes Forest
- Narrabeen Snappy Gum Forest
- Narrabeen Warm Temperate Subtropical Rainforest
- Riverine Alluvial Gallery Rainforest Moist Forest
- Disturbed

- Farm Dams
- Water Bodies
- Cleared Land

Hansen Bailey



Source: Wyong Areas Joint Coal Venture  
OZark Environmental and Heritage Management

## WALLARAH 2 COAL PROJECT

### Vegetation Communities within the Project Boundary

Cad File: 07803E.dwg

Date: 12.10.11

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Figure  
**11**



The W2CP EA presented assessment of potential ecological impacts associated with the W2CP in three parts:

- Direct impacts associated with the establishment of surface facilities;
- Indirect impacts as a result of W2CP related subsidence; and
- Assessment of ecological values of unaffected WACJV lands for the purpose of formulating a Biodiversity Offset Strategy.

The Project is expected to require the removal of approximately 33 hectares of native vegetation, including 4.5 hectares at the Buttonderry Site, 17.3 hectares at the Tooheys Road Site, 0.92 hectares within the Wyong State Forest and up to 10 hectares for the construction of the proposed rail loop.

The design and layout of surface facilities have been undertaken with a view to minimise vegetation and habitat impacts. Hence most of the infrastructure will be able to be sited on cleared grazing land or disturbed / regrowth lands.

However, some of the vegetation clearing at the Tooheys Road Site would directly impact areas containing *Angophora inopina* and *Tetratheca juncea*, both of which are listed in the “vulnerable” category under State and Commonwealth threatened species legislation.

Squirrel Gliders, Wallum Froglets and a likely Powerful Owl nesting site have also been identified within the Project Boundary.

WACJV proposed to offset vegetation loss and biodiversity impacts through the dedication of 50 hectares of land in the vicinity of Hue Hue Road, 6 ha of *Angophora inopina* revegetation at the Tooheys Road Site and 12 ha of vegetation enhancement along Wallarah Creek at the Tooheys Road Site. There would be approximately 115 ha of forested land owned by WACJV that would not be disturbed between Tooheys Road and Buttonderry Sites, and a further 318 ha of forested land within Project areas that would not be disturbed by the Project.

Through detailed ecological surveys of surface facility sites, three Endangered Ecological Communities (EECs) listed in the TSC Act have been identified at the Tooheys Road Site, and one at the Hue Hue Road offset site. Ten threatened flora species and ten threatened fauna species, as listed under the TSC Act have been identified in the area.

W2CP’s assessments of significance for these species have concluded that the Project is unlikely to significantly affect the species, populations, or their habitats.

### 8.2.2 Residual Matters

The PAC noted that it was satisfied that the Proponent has undertaken an adequate level of ecological assessment for surface facility sites associated with the W2CP, and that impacts could be constrained within acceptable limits subject to the provision of appropriate biodiversity offsets and Project of a formal Ecological Management Plan.

The DG EA report of the W2CP EA noted that additional work would be useful to reduce or remove uncertainties or residual environmental risks in relation to ecological matters in particular locations.

DP&I noted that limitations in site specific subsidence modelling in the western forested hills area in the west of the Project indicated a level of uncertainty which, combined with the perceived limited ecological surveys in that area, resulted in uncertainty of ecological impacts in that location. This issue was given by the Minister as a reason for project refusal in his determination on 3 March 2011:

*“Uncertainty around the ecological impacts, particularly in the western portion of the site, as a result of a lack of ecological survey effort combined with uncertainty as to subsidence predictions in the [western forested hills] area”*

The PAC report (November 2010) identified that the lack of site ecological survey on the valley floor limited the ability to evaluate the potential impacts on amphibians and other aquatic species and their adaptability to changes due to subsidence. Adaptive management approaches alone were perceived to be insufficient to deal with such impact uncertainties.

Both the DP&I and PAC reports noted that there would be benefits from additional ecological assessment of direct impact areas and potential offset areas by the use of the BioBanking assessment methodologies to enable a perceived objective metric of ecological status and value.

### **8.2.3 Assessment Methodology**

It is proposed that the Wallarrah 2 EIS will include all relevant existing W2CP studies contained in the W2CP EA plus consideration of additional work as follows:

- A targeted ecological study over the western forested areas particularly including ephemeral drainage lines, any important related aquatic ecosystem elements, and areas of significant subsidence effect predicted in the additional subsidence assessment in the western forested area;
- Prepare an updated and consolidated ecological report which compiles and integrates all ecological studies and reviews any relevant recent studies or plans by other parties including Government;
- Conduct a comprehensive Biobanking assessment of the direct impact areas as well as remaining parts of the surface sites and the company’s proposed “offset” lands to substantiate the Project of the proposed offsets strategy;
- Conduct a suitably scoped (including using a risk-based approach) ecological survey over the valley floor areas with a view to clarify predicted impacts on fauna species from subsidence effects and to refine mitigation and adaptive management strategies. The survey or study should include amphibian species and aquatic ecosystems and focus on threatened or endangered water-dependent species; and
- Refinement of the ecological offset package in consultation with relevant regulators.

## **8.3 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE**

### **8.3.1 Background**

OzArk EHM reports demonstrated that only the Tooheys Road Surface facilities site was considered to have areas containing potential Aboriginal sites/items that could be potentially affected by direct impacts of clearing and earthworks disturbance. Accordingly, a test excavation program was undertaken to allow detailed site investigation and assessment.

As reported by DP&I in its assessment report in March 2011, the test excavation investigation found 14 artefacts (tool, flakes, etc) and concluded that there is very low archaeological potential within the area that may be directly impacted by the W2CP. OzArk EHM and WACJV recommended measures to manage construction activity (such as stop work practices) and to limit the extent of disturbance in areas that could potentially contain items of Aboriginal heritage.

The DP&I concurred with the findings of the assessment, and considered the management of this impact could be suitably conditioned, should the Minister determine to approve the Project.

Due to the lack of site evidence found in site survey of the other surface facility sites (Buttonderry and Western Shaft site), and given the nominated mitigation and management measures, it was concluded that there was very low risk associated with these developments in the Project.

The investigations undertaken for the subsidence (indirect impact) area above the mine plan involved less intensive, targeted survey methods guided by predictive models due to the lack of site access to private property especially in the valley floor and due to the scale of (and often difficult access to) the western forested hills lands. Desktop analysis was used to assist the evaluation of privately owned valley floor areas which were generally characterised by substantial disturbance where it was unlikely that indirect impacts would affect any significant or intact Aboriginal sites or values.

OzArk EHM concluded that further Aboriginal sites are expected in the Wyong Forest Study Area and that axe-grinding grooves would form the majority of sites that remain to be recorded there. The assessment concluded that these are a common feature, and that the scientific and public significance is rated as Low-Moderate with high cultural significance.

### **8.3.2 Residual Impacts**

DP&I in its March 2011 assessment report noted that limitations in site specific subsidence modelling in the western forested hills area in the west of the Project indicated a level of uncertainty which, combined with the perceived limited heritage surveys in that area, resulted in uncertainty of Aboriginal heritage impacts in that location. This issue was given by the Minister as a reason for project refusal in his determination on 3 March 2011:

*“Uncertainty around the heritage impacts, particularly in the western portion of the site, as a result of a lack of heritage survey effort combined with uncertainty as to subsidence predictions in this [western forested hills] area;”*

### 8.3.3 Assessment Methodology

Accordingly, it is proposed that the Wallarah 2 EIS will include all relevant existing project studies from the W2CP EA and supplementary documentation plus consideration of the following in relation to Aboriginal heritage assessment:

- A additional targeted Aboriginal heritage study over the western forested areas particularly including ephemeral drainage lines (targeting grinding grooves), any areas of significant rock outcrop not already surveyed, and prospective heritage areas that are likely to register potentially significant subsidence effects according to predictions of the additional subsidence assessment in the area;
- Formal survey will be undertaken in the presence of Aboriginal community representatives in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2011) and will;
- Consider the preparation a single, consolidated Aboriginal heritage report(s) which compiles and integrates all Aboriginal heritage studies by the Project; and
- Consider the Aboriginal heritage values that may be present in “offset” or conservation lands owned by the W2CP as part of overall heritage management approaches for the Project.

## 8.4 SURFACE WATER

### 8.4.1 Background

The potential impact of proposed underground mining on the surface water supply system has been subject to detailed assessment. A rigorous analysis of potential effects is contained in the W2CP EA. It is noted that the proposed Extraction Area represents approximately 5% of the local water supply total catchment area.

Factors that govern the supply of water from a catchment include:

- Amount and distribution of rainfall and amount of evapotranspiration;
- Shape and size of the catchment;
- The geology of the catchment including the nature and distribution of lithologies, soils and alluvial deposits;
- Hydrological characteristics of the catchment;
- Prevailing hydrogeological conditions in the underlying rock formations and alluvial systems associated with the former and present creeks and rivers;
- Types and distribution of vegetation;
- Types and distribution of land use; and
- The amount of water extracted from river sources for irrigation and municipal purposes, and from bores by registered users.

The water quality is also considered important because it can determine the usefulness of the supply for municipal and other purposes.

These issues were fully addressed in the W2CP EA and will be included in the Wallarrah 2 EIS.

WACJV has been cognisant of the importance the water supply and at the outset of the Project planning it made public its commitment that the only mine plan that would be submitted to the NSW Government would be one that safeguards the surface and underground water regimes.

#### **8.4.2 Residual Matters**

The DG EA Report noted five key issues associated with the assessment of surface water impacts from the W2CP, including:

- Changes to hydrogeology, surface connectivity and aquifer impacts;
- Site water balance and waste water treatment;
- Impacts on the Central Coast water supply;
- Subsidence induced changes to flooding characteristics; and
- Changes in watercourse geomorphology.

The assessment by the PAC and DP&I agreed that the catchment and water supply regime were not at risk from the W2CP and no unacceptable residual environmental risks exist:

*“The Department acknowledges and understands the significant community concern which has been expressed in relation to this issue. However based on the independent Wyong Water Study, the international peer review and the PAC’s independent review, the Department considers the risk to the Central Coast’s water supply as a result of the project to be minimal and manageable.”* (p24, DG EA Report March 2011)

#### **8.4.3 Assessment Methodology**

The Wallarrah 2 EIS will update the extensive assessment provided in the W2CP EA on the water supply scheme operated by the Gosford-Wyong Councils Water Authority. The key elements of the scheme have been subject to upgrading and the regional water supply context has also changed, such as the status of the proposed Tillegra Dam project.

### **8.5 WATER BALANCE**

#### **8.5.1 Background**

The W2CP EA outlined the W2CP’s water management strategy and provided a typical water balance to describe the various sources, flow pathways and ultimate uses and re-uses of water intercepted by the Project.

Studies show that the Project will typically “make” around up to 2.5 ML per day. In the early years there is expected to be a slight water deficit, but a surplus will occur in later years. It is expected that underground water will be moderately saline and will therefore require treatment prior to reuse or discharge.

It is proposed to construct a desalination plant using well proven RO technology (or similar) to effectively treat mine water to required standards. Treated water can then be used in the mine for cooling, dust suppression and underground equipment purposes. Surplus water will be treated to an appropriate standard for discharge to Wallarah Creek. Other water treatment or management options may be considered depending on the balance of environmental and socio-economic priorities.

It is envisaged that potable water for drinking and amenities would initially be trucked on-site during construction before eventually connecting the site to town supply.

### 8.5.2 Residual Matters

The DG EA Report noted issues raised by the PAC about the degree of completeness of the water balance study and that the proponent had not *“demonstrated that proposed water treatment systems are capable, in principle, of appropriately treating wastewaters to an acceptable standard”*.

DP&I also noted concerns by DECCW (now OEH) which considered that the application had limitations in the assessment of both brine disposal and management of treated water, including potential discharge to streams or supply offsite to other water users. DP&I also noted that the PAC did not find this situation unacceptable but instead recommended relevant but stringent conditions of consent to address on these matters as deemed appropriate.

The conclusion of the DP&I was that the limited information presented on these aspects has resulted in an uncertain and therefore unacceptable level of residual risk. This view was, in turn, noted in the Instrument of Refusal as one of the reasons for project refusal:

*“The project does not adequately address potential surface water quality impacts, resulting in uncertainty around the ability of the project to meet acceptable water quality outcomes.”*

### 8.5.3 Assessment Methodology

Given these perceived reservations about how water management was addressed in the W2CP EA, WACJV will ensure that the Wallarah 2 EIS will include the following additional matters:

- Confirm the potential for the surface facilities to be connected to WSC water and sewerage systems from the outset of the Project, and allow for this information within the Project water balance considerations over life of mine;
- Undertake further numerical assessment on water balance, incorporating a range of climatic and mine water make scenarios as well as all likely project water demand/use circumstances through stages in the life of project, including cases of offsite water supply opportunities or treated water discharge;
- Evaluate generalised water quality aspects (especially salinity) of various components throughout the water management system;
- Further develop options and define a preferred system for brine management derived from water treatment processes and assess the impacts of the proposed arrangement;



- Provide typical operating performance conditions for the proposed water treatment plant including general water quality of inputs and outputs;
- Develop appropriate scenarios for offsite water provisions (treated/ non-treated) and consider these in the water balance assessment; and
- Evaluate scenarios involving possible discharge of treated water from the Tooheys Road Site and assess the implications on receiving waters and aquatic ecosystems using ANZECC Guidelines and OEH guidelines.

## 8.6 GROUNDWATER

### 8.6.1 Background

A comprehensive groundwater impact assessment was carried out for the W2CP EA by Mackie Environmental Research. The specialist report included numerical computer simulations and predictions of mine water seepage and depressurisation/dewatering impacts on hardrock and alluvial lands. An independent expert peer review of the Mackie groundwater assessment report was also undertaken by Dr Frans Kalf.

Within the proposed mining area, groundwater is contained in both hardrock sedimentary units (Permian and Triassic rocks which underlie the entire Project Boundary) and alluvial aquifers associated with the unconsolidated sediments which occupy the drainage lines dissecting the area of investigation.

Coal seams within the Project Boundary are at depths of at least 350 m and up to 690 m. The overlying material is moderately strong to strong in geotechnical terms. The overburden also contains many claystones and similarly fine grained units.

The major valleys within the Project Boundary are composed of alluvial sediments up to 40 m thick, which contain a significant fine grained fraction. In this situation, should cracking occur in the underlying hardrock basement below the alluvial sediments (*"rockhead"*) they are likely to be infilled with these *"plastic"* sediments, which will act as a relatively low permeability seal.

The comprehensive groundwater assessment in the W2CP EA examined the hydraulic connectivity between bedrock and the overlying alluvium. This information will be included in the Wallarrah 2 EIS.

The strata above the coal seams are tight, with low potential for significant groundwater movements. The coal seams are considered to have the greatest aquifer potential within the hardrock sequence. Sudden high groundwater inrush is highly unlikely and is not expected to be a serious issue.

Water pumped from the Project will consist of collected groundwater seepage into the mine as well as recycled water returned underground for the mining process. The collected water will require treatment prior to discharge or being directed offsite for most reuse options. The proposed treatment system will be a RO process or similar which will be capable of producing up to potable quality treated water or for reuse on site and other beneficial uses such as supply to the Gosford-Wyong Water Supply Scheme or to other water users.

The Extraction Area occurs beneath a land surface area that represents only 5% of the total catchment of the Gosford-Wyong Water Supply Scheme. The Extraction Area is not beneath any important surface features or water scheme infrastructure. Only a fraction of this 5% of catchment area involves lands relating to alluvials. In addition, the Extraction Area has been carefully designed to ensure that mining can proceed while safeguarding catchment functions.

Longwall panel geometry (particularly width but also extraction height) and mining depth (depth of cover) are major mine planning factors in determining surface subsidence impacts from mining. These factors governing subsidence and, potentially, the impact on surface water flow have been important considerations at the design stage that have been taken into account in preparing the mine plans.

### **8.6.2 Residual Matters**

The DG EA Report noted five key issues associated with the assessment of groundwater impacts from the W2CP, including:

- Changes to hydrogeology, surface connectivity and aquifer impacts;
- Site water balance and waste water treatment;
- Impacts on the Central Coast water supply;
- Subsidence induced changes to flooding characteristics; and
- Changes in watercourse geomorphology.

### **8.6.3 Assessment Methodology**

The comprehensive investigations already undertaken have demonstrated that potential groundwater risks are dominated by localised and temporary effects and can be satisfactorily managed. The existing studies will be reviewed and updated as required, including validation or refinement of the existing model of alluvial groundwater systems given the availability of new monitoring data.

Groundwater that will be affected by the Project is well below the depth of that groundwater which is used for farming and domestic water supplies. The groundwater system will readjust to a new equilibrium over the long term. Water in the mine will be pumped to the pit top at the surface. It is likely to be saline and unusable for any domestic or rural purpose without treatment.

The groundwater impact assessment will address the following issues for the Wallarrah 2 EIS:

- Potential mining impacts on groundwater condition and usage;
- Potential groundwater make;
- Potential impacts of subsidence;
- Potential impacts and opportunities for saline water management and (if relevant) brine management; and
- Potential regional impacts.

## **8.7 AIR QUALITY**

### **8.7.1 Background**

#### ***Air Quality***

A full assessment by PAEHolmes Air Sciences of the air quality impacts associated with the construction has been conducted and included in the W2CP EA. Using considerable background air quality and meteorological monitoring data collected since 1996 and in accordance with relevant guidelines provided by OEH, the report demonstrated that W2CP will readily comply with regulatory criteria set by OEH and goals set by NEPC at adjacent receptors in terms of TSP, PM<sub>10</sub> and dust deposition. The assessment goals for PM<sub>2.5</sub> were also demonstrated to be met.

Coal handling, conveying, stockpiling, train loading activities and mine ventilation exhaust emissions were identified as the main potential sources of fugitive and point source emissions. Standard engineering measures proposed by WACJV such as enclosures and water suppression spraying were noted and agreed by the PAC and DP&I as effective measures for mitigation.

A health risk assessment was undertaken based on numerical evaluation of known particulate emissions size profiles and typical proportionality of PM<sub>2.5</sub> in mining dust emissions. Also, the specific attention assessing the silica in dust also demonstrated that this health risk element to be well within health criteria for all surrounding receptors.

### **8.7.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to air quality impacts.

Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated air quality impact assessment.

### **8.7.3 Assessment Methodology**

An air quality, and greenhouse gas impact assessment will be conducted for the Project in accordance with OEH 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW' (Approved Method) (DEC 2005b) and the Australian Greenhouse Office's (AGO) *Factors and Methods Workbook* (AGO 2005).

The scope of assessment will include:

- A review of local meteorological data, including wind speed and direction, temperature, humidity, rainfall and evaporation;
- A review of background ambient air quality monitoring data to identify representative values for existing background dust deposition, PM<sub>10</sub>, PM<sub>2.5</sub> and TSP for relevant averaging periods;
- Development of a predictive air quality model (using CALPUFF) to assess air quality impacts associated with the Project (and cumulatively with other approved and proposed developments) against regulatory criteria;
- An assessment of the potential for dust generation associated with construction activities;

- An assessment of cumulative air quality impacts with surrounding (and proposed) mining operations and industry;
- Review and recommendations to enhance the existing monitoring network;
- As assessment of potential spontaneous combustion impacts and emissions;
- An assessment of potential Scope 1, 2 and 3 greenhouse gas emissions; and
- The identification of appropriate best-practice management and mitigation measures in relation to dust, greenhouse and spontaneous combustion as required.

## **8.8 GREENHOUSE GAS**

### **8.8.1 Background**

Results from gas testing were initially compiled by GeoGAS Pty Ltd (1997) and a comprehensive assessment was undertaken. The following conclusions were made and are being incorporated in mine planning:

- Gas content is generally restricted to the coal seam and consists of greater than 95% methane;
- Gas content for areas not affected by intrusions can be predicted confidently from depth, ash content, and volatile matter;
- The regional gas content gradient is determined by depth below sea level, with gas contents in-seam ranging from 6.0 to 8.9 m<sup>3</sup>/t;
- Outburst potential is low but may need to be assessed around igneous structures; and
- Some form of gas drainage or gas capture will be required to achieve satisfactory gas levels in the mine with high production rates and acceptable ventilation levels.

To assist mine planning and ventilation studies, the gas content relationship has been used to develop a three dimensional gas content model. This model extends from 30 m above the potential working section (includes all overlying coal) to 70 m below the potential working section.

Calculations for this model utilised all existing quality and structural information, using model estimates where possible and default values for deeper unnamed and not-modelled seams. The final model takes into account coal left in the roof and floor above and below the working section.

Mine planning and scheduling has taken place on the assumption that gas drainage will be implemented. The Project involves pre-drainage of methane gas using in-seam drilling methods unless surface access is provided such as if it occurs on the WACJV owned land. Gas drainage is proposed to be collected underground and piped to the surface facilities for ongoing treatment and a range of possible beneficial uses subject to commercial and legislative/policy development.

### **8.8.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to GHG impacts.

Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated GHG impact assessment.

### 8.8.3 Assessment Methodology

A greenhouse gas impact assessment will be conducted for the Project in accordance with the Australian Greenhouse Office's (AGO) *Factors and Methods Workbook* (AGO 2005):

- As assessment of potential spontaneous combustion impacts and emissions;
- An assessment of potential Scope 1, 2 and 3 greenhouse gas emissions; and
- The identification of appropriate best-practice management and mitigation measures in relation to dust, greenhouse and spontaneous combustion as required.

## 8.9 NOISE

### 8.9.1 Background

The W2CP EA included a noise impact assessment report by Atkins Acoustics. The assessment followed the procedures recommended in the Industrial Noise Policy (INP). This included appropriate background noise survey to establish the Rating Background Level (RBL) from which the anticipated noise levels generated by the proposed activities on each site were assessed. In accordance with the procedures of the INP, adverse meteorological conditions (wind and temperature inversion) were taken into account as required based on historic meteorological data.

The assessment demonstrated that with the implementation of standard noise control systems, the surface infrastructure will meet the necessary noise assessment goals at the nearest residential receptors.

### 8.9.2 Residual Matters

There are no significant outstanding matters associated with the Project with regard to noise impacts.

Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated noise impact assessment.

### 8.9.3 Assessment Methodology

The W2CP EA Noise Impact Assessment will be revised for the Project. The scope of assessment will include:

- A review of noise monitoring data and previous assessments undertaken;
- Assessment of site meteorology and background noise levels to determine likely criteria for the Development;
- Predictive noise modelling of the Projects infrastructure in accordance with the INP for both construction and operational activities, including sleep disturbance impacts;
- Assessment of road traffic noise in accordance with the *Environmental Criteria for Road Traffic Noise 1999* (ECRTN);
- A qualitative assessment of rail noise from the rail spur and loop to the junction of the Main Northern Railway;

- Assessment of vibration blasting impacts at sensitive receptors;
- Assessment of cumulative noise and blasting impacts;
- The identification of noise and blasting mitigation and management measures; and
- A recommended post approval management and monitoring program.

## **8.10 TRAFFIC AND TRANSPORT**

### **8.10.1 Background**

Parsons Brinckerhoff undertook a traffic and transportation study for the W2CP in 2006 which is included in the W2CP EA. The Project will primarily generate road traffic movements from the construction and operation of surface mine facilities. A further and substantially expanded traffic study was completed in 2010 and also appears in the W2CP EA.

It is anticipated that the duration of construction of the mine facilities at each of the sites will be approximately 2.0 to 2.5 years. Minor impacts only are predicted due to construction and mitigation measures will manage these issues adequately.

All coal produced will be transported to the north by rail either to the Port of Newcastle or to domestic Power Stations. A comprehensive rail capacity study was undertaken as a separate study in conjunction with the W2CP EA.

### **8.10.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to traffic and transport impacts.

Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated traffic impact assessment.

### **8.10.3 Assessment Methodology**

Transportation issues that require assessment and will be reported in the Wallarah 2 EIS include the following:

- Site Access Requirements – each of the surface sites will require appropriate vehicular access for road transport of personnel and materials;
- Adequacy of Existing Road Network – a detailed assessment of the existing road network and traffic usage levels has been undertaken to assess its suitability to accommodate additional traffic generated by the Development;
- Construction Stage Traffic Impacts - The potential traffic impacts during the construction stage of the Development, which may involve significant heavy vehicle traffic, are identified and assessed including the need for appropriate short term road capacity improvements or mitigation measures giving due consideration to the duration of the relevant construction traffic activity;
- Operational Stage Traffic Impacts - The main potential traffic impacts which would occur during the ongoing operational stage of the Project will also be identified and assessed



including any need for road improvements or mitigation measures for roads or intersections on the local road network;

- Road Safety - A review of recorded traffic accident data will be undertaken in the vicinity of each of the surface facilities to identify current and potential future road safety concerns in each locality which may be affected by the Development;
- Road Maintenance - Where the Project is likely to result in additional heavy vehicle traffic usage of the WSC maintained road network on a sustained basis, the potential road maintenance implications of this traffic will be assessed;
- Effects of Subsidence on Roads / Flood Free Access - The potential effects of future mining subsidence on the local road networks of the Dooralong and Yarramalong valleys will be assessed, including bridge crossings and the potential effects of differential settlement on the road surface;
- Rail System Capacity - The existing rail system capacity has been documented and assessed for the various types of trains which currently use the system including express and all stations passenger services, export coal, domestic coal and general freight train operations. The assessment also documents existing usage levels of the system and current spare capacity; and
- Assessment of Future Increased Usage - This assessment has been undertaken and will be included in the Wallarah 2 EIS. It is based on the current spare capacity of the rail system but also considers how existing coal train and other train demand through the area may increase in addition to the Project transport requirements and how these increases may be accommodated by any potential increases in the capacity of the rail system from general network upgrading.

## **8.11 NON-ABORIGINAL HERITAGE**

### **8.11.1 Background**

The W2CP EA included a study by OzArk EHM which identified non-Aboriginal heritage items within the Project Boundary. No items were identified within the direct impact areas (surface facilities site). Within the area to be indirectly impacted, there are two items listed within the Wyong LEP and 10 items identified in previous studies (but not listed).

### **8.11.2 Residual Matters**

The DG EA Report noted that property access difficulties limited the detailed assessment of the significance of items located on private property. However, there is a reasonably high level of confidence that the sites were of only local significance, in accordance with their relevant heritage listing.

The impact of subsidence upon these items / structures is considered manageable through mitigation and response measures. The assessment concluded that although these items would be impacted by subsidence it would be a low risk situation at these impacts can be suitably mitigated through measures contained in the future SMP / Extraction Plan that should be informed by further site investigation and assessment if practicable.

### 8.11.3 Assessment Methodology

It is anticipated that detailed and site specific assessment of heritage values and mitigation measures will be most appropriate during the development of individual Property Subsidence Management Plans.

The Wallarah 2 EIS will include all relevant existing studies detailed in the W2CP EA and any updating of these as required. The study will include:

- A review of any relevant existing heritage assessment reports and other sources of information regarding heritage items in the region;
- Assessment of the heritage significance of identified items within the Disturbance Boundary;
- Identification of potential impacts to sites of heritage significance; and
- Identification of any necessary impact mitigation measures.

## 8.12 VISUAL

### 8.12.1 Background

A Visual Impact Assessment was carried out by Andrews Neil Urban Design Group for the W2CP EA. The surface facilities for the Project are likely to be at least partly visible from some public accessible vantage points and isolated residential locations. Possible infrastructure siting options have been constrained by the increased Project pressure in the local area and land acquisition issues. Most of the substantive surface facilities are to be sited on the Tooheys Road Site. The rail line will be partly located on an elevated ridge but will be afforded some visual screening by earthwork cuttings in this area. Other parts of the facilities at the Tooheys Road site may be visible to a very limited extent only by some nearby residents. Potential visual access (although generally fleetingly) would be available to people travelling along the F3 Sydney-Newcastle Freeway, at least until visual screening by landscaping is established.

The main ventilation facility will be situated on the Buttonderry Site, opposite a former rural residential area which has now been designated for future industrial development. The intervening natural topography will screen the ventilation and building facilities from any residential areas. However, it is likely that it will still be apparent from some public roadsides and other viewpoints.

W2CP has already carefully considered the design, placement, materials and screening while further developing the proposal. This information is included in the W2CP EA and will be provided in the Wallarah 2 EIS. However, given the local topography, it will be difficult to minimise visual impacts entirely through screening. Also, an innovative landscaping plan, which enhances the long term visual environment, will be considered integral to the proposal.

### **8.12.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to visual impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated visual impact assessment.

### **8.12.3 Assessment Methodology**

The Visual Impact Assessment will be revised consistent with all technical reports and contemporary regulatory requirements. The scope of assessment will include:

- Characterisation of the existing visual environment and landforms;
- Identification of sensitive view sheds (including nearby residences);
- Assessment of the visual sensitivity of the view sheds;
- Review of the mine plan to recommend any suggested additional mitigation measures to be incorporated into it;
- Assessment of potential impacts due to night lighting;
- Project of a 3D digital terrain model incorporating photomontages at relevant locations;
- Assessment of the degree of visual landscape alteration that the Project would have on sensitive view sheds, including the use of visual simulations where appropriate; and
- Identification of any onsite and off-site impact mitigation measures necessary for the Development.

## **8.13 SOCIAL**

### **8.13.1 Background**

The W2CP EA included a Social Impact Assessment prepared by Martin and Associates and a comprehensive economic assessment by the respected and independent Central Coast Research Foundation (part of the Hunter Valley Research Foundation), a specialised group who deal specifically in economic evaluation and modelling. The combined assessment covered the following key issues:

- Effects on primary social indicators such as house and land values, community expectations and perceived implications;
- Effects on social and community infrastructure and services including education, health and safety;
- Effects on employment and determination of flow on economic costs and benefits; and
- Identification of community issues and the formulation of specific mitigation and offsets for the Development.

Although it is known that the overall economic and social benefits of the Project are substantially positive, the study allowed the identification and consideration of any specific local negative implications that were then used to form an appropriate compensation package for the Development.

This process has provided constructive community consultation that resulted in a number of significant changes to the Project design to mitigate and limit the impacts of the development on the community as well as to preparing a Community Enhancement Program.

### **8.13.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to social impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated social impact assessment.

### **8.13.3 Assessment Methodology**

A comprehensive SIA will be developed which will identify any potential impacts of the Project on the local and regional community, paying particular attention to the demand it may generate for the provision of additional infrastructure and services.

Due to the extended demand for community services as a result of the Project, a Voluntary Planning Agreement (VPA) will be required to be developed under Section 93F of the EP&A Act with WSC. The SIA will also identify key issues to assist in directing the VPA with WSC.

The assessment will also identify the beneficial and potential adverse impacts of the Project from a social perspective. The assessment of impacts will take into account the relevant demographic, social, cultural and economic profiles and will include an estimation and analysis of the Project's economic parameters.

## **8.14 ECONOMICS**

### **8.14.1 Background**

The commencement of mining within the Project Boundary will involve significant capital investment, ongoing operational expenditure and the direct employment of up to approximately 300 full-time equivalent employees during operation of the Project at full production, of which 70% would be targeted to be sourced locally. In addition, a substantial annual allowance has been made for activities such as youth employment, health workshops and recreational support facilities.

The Project will contribute to flow-on economic effects such as the creation of indirect employment opportunities and significant expenditure at a local and State level.

Total revenue to Government is estimated to be over \$1 billion over the Project life and substantial indirect economic benefits will arise from ongoing expenditure on services, maintenance, plant and equipment and flow-on employment effects. As well as the direct employment of 300 full time equivalent employees, some 750 new jobs are expected to be supported in the local and regional economy stemming from the indirect effects of the new Project.

### 8.14.2 Residual Matters

There are no significant outstanding matters associated with the Project with regard to economic impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be undertaken in the updated economics impact assessment.

### 8.14.3 Assessment Methodology

The updated Economics Impact Assessment will be completed for the Project in accordance with DP&I's '*Guideline for economic effects and evaluation in EIA*' (2002).

The scope of assessment will include:

- A benefit cost analysis (threshold value analysis) of the Project;
- A regional economic impact assessment of construction and operation of the Project;
- Quantification of the economic cost, benefits and impacts of the Project, considering competing land and water uses in the region for different land uses;
- Undertake an Agricultural Productivity Impact Assessment if required; and
- Any necessary mitigation measures, as required.

The economic analysis will assess the potential incremental economic costs and benefits of the Project to the community (i.e. consideration of economic efficiency). This will not only include a consideration of the regional economic impact or economic activity generated by WACJV but also any incremental costs and benefits to the environment.

## 8.15 BUSHFIRE

### 8.15.1 Background

The Project Boundary is partly located within the Wyong State Forest and Jilliby State Conservation Area which is dominated by dry eucalypt woodlands and open forests.

Due to the potential for build-up of high fuel loads (leaf drop and tinder) over time, a risk of bushfire presents itself to the land within the Project Boundary.

The bushfire season experienced in the Central Coast Region of NSW occurs predominantly during the hotter months from September to April. Depending on factors such as temperature, available fuel loads and rainfall, the frequency and intensity of bushfires will vary.

The area surrounding the Wyong State Forest and Jilliby State Conservation Area within the Project Boundary is predominantly cleared rural land, dominated by grazing and cropping activities (turf) which present a much lower bushfire hazard. The Wyong State Forest and Jilliby State Conservation Area lie to the north and west of the Project Boundary consisting of dense forest vegetation and consequently is a higher bushfire hazard.

### **8.15.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to bushfire impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated economics impact assessment.

### **8.15.3 Assessment Methodology**

Onsite bushfires and potential bushfire hazards will be assessed and managed in accordance with the *Rural Fires Act 1999* and regulated by the NSW Rural Fire Service.

Fire controls and emergency systems will be put in place in accordance with the *Coal Mines Health and Safety Act 2002* (CMHS Act).

## **8.16 HAZARD ANALYSIS**

### **8.16.1 Background**

A relevant hazard assessment will be completed for the Project which will aim to identify any potential hazards associated with the Project and develop possible management and control procedures as specified in the relevant legislation.

This assessment will follow *SEPP 33 – Hazardous and Offensive Development Application Guidelines* (DUAP 1994) (SEPP 33 Guidelines), and the *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (Planning NSW 1997).

A number of potential hazards were identified and assessed utilising the SEPP 33 Guidelines screening procedure. It is unlikely that any aspect of the Project is likely to be considered to be hazardous or offensive.

Despite this, the risk assessment process will be undertaken to identify typical management measures that will be implemented to ensure operations are undertaken safely.

The Project will require the transport and storage of diesel, materials for explosives and other substances which may be considered to be potentially hazardous.

### **8.16.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to Hazard impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated hazard analysis.

### **8.16.3 Assessment Methodology**

The hazard impact assessment will require the key components of the Project to be reviewed against the threshold values and screening procedure as provided within the SEPP 33 Guidelines. The key components of the Project will also be risk assessed and relevant controls developed in order to keep risk to a minimum.

## 8.17 SOILS AND LAND CAPABILITY

### 8.17.1 Background

The Soil Landscapes of the Gosford – Lake Macquarie 1:100,000 sheet was reviewed in the W2CP EA to identify the soil types of the Project Boundary. The impacts on soils above the underground Extraction Area will be indirect through the effects of subsidence.

Impacts on the soil structure and material that could potentially arise as a result of subsidence are limited to the physical characteristics of the soil material; the chemical composition will not be altered.

Physical effects that may be experienced include:

- Hard-setting soil surfaces are more likely to crack as a result of subsidence than other soil materials that have a high plasticity or loosely consolidated;
- Cracks in the soil surface, if left un-rehabilitated, may have the potential to cause erosion;
- Where subsidence results in localised pooling of water that would not otherwise occur, the wet strength of the soil material may be of importance; and
- In situations where a steep slope is tilted, there may be the potential for some slumping to occur in susceptible soil materials.

Above the mining areas there are six different soil landscapes, and numerous different soil materials. The higher risk areas for soil disturbance occur in the more elevated terrain within Wyong State Forest. More low lying flood plain areas tend to contain loose unconsolidated alluvial material which has a low risk of soil disturbance due to subsidence with the exception of some creek beds.

A land capability assessment was carried out as part of the W2CP EA. NSW Agriculture has classified the agricultural land in Yarralong Valley and parts of Dooralong Valley. The floodplain areas of each of these valleys are mapped as Class 2.

Land to be directly disturbed as a result of the Project will be required to be rehabilitated to a stable, self-sustaining condition. Subsidence impacts, through changes in hydrological characteristics, landform and erosion in the floodplain may impact upon the land within each agricultural classification. These changes could promote some areas to a more arable classification and degrade others to a lesser classification. The area of each agricultural land classification within the zone of subsidence is provided in **Table 10**.

### 8.17.2 Residual Matters

There are no significant outstanding matters associated with the Project with regard to soils and land capability impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be undertaken in the updated soils and land capability impacts assessment.



**Table 10**  
**Agricultural Land Classification within Potential Zone of Subsidence**

<b>Agricultural Land Classification</b>	<b>Area within Subsidence Zone*</b>	<b>% of Total Subsidence Zone*</b>
2	541.5 ha	14.1%
3	519.8 ha	13.6%
4	562.2 ha	14.7%
5	221.3 ha	5.8%
State Forest and State Conservation Area	1980.2 ha	51.8%

\*As identified in the W2CP EA

### 8.17.3 Assessment Methodology

A Soils and Land Capability Impact Assessment will be completed for the Wallarrah 2 EIS. The scope of assessment includes:

- Review of previous relevant assessments;
- Soils assessment of areas to be disturbed in accordance with the requirements of the NSW I&I Guidelines; and
- Identification of any impact mitigation measures as necessary.

## 8.18 AGRICULTURE

### 8.18.1 Background

Since completion of the W2CP EA, DP&I has released the *Draft Strategic Regional Land Use Policy Guideline for Agricultural Impact Statement* guidelines (DP&I 2011) which require that all Major Projects consider these guidelines. An Agricultural Impact Assessment was not required to be carried out for the W2CP EA.

### 8.18.2 Assessment Methodology

If required, an Agricultural Impact Assessment will be completed for the Project in accordance with DP&I's *Draft Strategic Regional Land Use Policy Guideline for Agricultural Impact Statement* (DP&I 2011).

The scope of this assessment will include:

- A detailed assessment of the agricultural resources and agricultural production potential of the Project Boundary and surrounds;
- Identification of the agricultural resources and current agricultural enterprises within the surrounding locality of the Project;
- Identification and assessment of the impacts of the Project on agricultural resources and industries (including cumulative impacts);
- Account for any physical movement of water away from agriculture;
- Assessment of socio-economic impacts;

- Identification of options for minimising adverse impacts on agricultural resources, including agricultural land, enterprises and infrastructure at the local and regional level; and
- Consultation with adjoining land users and Government departments.

## **8.19 REHABILITATION, FINAL LAND USE AND CLOSURE**

### **8.19.1 Background**

Under the W2CP EA it was anticipated that no significant surface cracking or other visible land disturbance would be expected to occur in the valley areas, and limited if any within the forested hills of the Wyong State Forest and Jilliby SCA. However rehabilitation techniques which would be required to be employed should cracking occur include filling of cracks, revegetation and erosion control measures.

On completion of mining, the Buttonderry Site will likely be available to be converted to a commercial building consistent with the surrounding land uses. The Tooheys Road Site will be deconstructed and the disturbance area will either be rehabilitated compatible with surrounding land use and to a condition similar to that which existed prior to Project associated disturbance or it would be available for industrial (re)development in accordance with current land use zoning.

### **8.19.2 Residual Matters**

There are no significant outstanding matters associated with the Project with regard to rehabilitation, final land use and closure impacts. Consideration however, of contemporary guidelines and standards from the relevant regulatory authorities and other stakeholders will be taken in the updated rehabilitation, final land use and closure impacts assessments.

### **8.19.3 Assessment Methodology**

Further planning and detail will be provided in the Wallarah 2 EIS with regard to the re-establishment of existing vegetation communities and the final landform.

The Wallarah 2 EIS will include a detailed description of the proposed rehabilitation strategy for the disturbance areas, having regard to the key principles in the '*Strategic Framework for Mine Closure*' (ANZMEC-MCA). Descriptions of the following will be included in the Wallarah 2 EIS:

- Rehabilitation objectives, methodology and conceptual completion criteria;
- Nominated final land use, having regard to any strategic land use planning or resource management plans or policies; and
- The potential for integrating this strategy with any other rehabilitation and ecological offset strategies in the region.

## 9 PRELIMINARY PROJECT JUSTIFICATION

In 1995, following a comprehensive tender process, WACJV was ultimately granted EL 4911, EL 5903, EL 4912 and A 405 by the Minister for Mineral Resources for the purpose of exploring for coal and evaluating the potential for a new coal mining operation within the Sydney Coal Basin.

The WACJV has fulfilled the commitments related to each of its mining authorities and has since conducted extensive exploration and environmental studies and concluded a final feasibility study into the development of an underground coal mine within these authorities.

As discussed in **Section 6** of this document the WACJV has previously sought Project Approval for the Project under the recently repealed Part 3A of the EP&A Act. This application was comprehensively assessed by the PAC which included a public hearing process.

The PAC panel which was constituted to review the Project comprised:

- Ms Gabrielle Kibble, Chairman of the PAC;
- Emeritus Professor Jim Galvin, a subsidence and mining expert;
- Dr Lloyd Townley, a groundwater expert;
- Dr Steve Perrens, a water expert; and
- Mr John Court, an air quality and noise expert.

In its Report, the PAC concluded:

*'After detailed consideration the Commission has concluded that the application may be approved subject to the imposition of a substantial number of conditions covering the full range of issues'.*

In relation to the environmental impacts of the Project, the PAC summarised its findings at pages ii-iii of the Report as follows:

*'The Commission notes that the mine plan has evolved over a decade of planning. The result of this evolution has been the minimisation of the subsidence, groundwater and surface water risks. The surface configuration is not ideal because it is spread over sites either side of the F3 Freeway, with stockpiling and loading of the coal taking place to the east of the Freeway. However, this configuration can be managed with appropriate operational and control measures.*

*The predictions of conventional subsidence, primarily in the Dooralong valley, are adequate to assure that consequences for groundwater and surface water will be minimal and manageable, provided adaptive mining management is practiced and the Commission's recommendations are implemented.*

*Only a small proportion of the Central Coast water supply comes from this catchment. There will be no significant adverse consequences for the Central Coast water supply, provided that no connectivity of surface water with the mining strata is caused by any major unidentified geological fault. This is very unlikely and avoidable in the Commission's judgment. Nevertheless, the Commission recommends close monitoring of the water table in the alluvial valleys to ensure early identification and addressing of any drawdown.*

*The Commission notes that, although the mine water balance is unresolved, the demands of water for the operation will not place inappropriate demands on the Central Coast water supply. There are uncertainties in the predictions of groundwater inflow to the mine workings mining which could result in either a surplus or deficit of water in the project water balance after an initial development period of several years. Any deficit needed for dust management could be supplemented from treated sewage effluent from the Charm haven sewage treatment plant. Any surplus water and effluent from the project could be treated and released but this type of activity would require better definition and further analysis.*

*Mine subsidence management should result in satisfactory outcomes for undermined houses and owners of structures using adaptive management, although a more wavy final landform may result if pillars do not collapse as predicted. The predictions of nonconventional subsidence and upsidence in the hilly forested country in the western part of the mining area need considerable further refinement which should be undertaken well before mining of that area commences in 12 to 15 years' time.*

*Flooding predictions indicate that the extent of flooding will not be significantly changed due to subsidence and that technical measures are possible to address road flooding. However, further work is required on changes to water flows and quality in the hilly forested country well before mining of that area commences.*

*Particulate air pollution predictions are adequate and within State and national limits. However, DECCW will need to be satisfied as to the initiatives proposed to address air pollution.*

*Noise from mining surface activities should be adequately controlled, and, if criteria are not satisfied, additional engineering measures are to be applied to the satisfaction of DECCW. Noise from rail movements of coal will need to comply with DECCW criteria.*

*Ecological impacts from surface activities should be offset to the satisfaction of DECCW.*

*Ecological impacts due to subsidence should be manageable in the alluvial valleys, with confirmation of this by ecological studies required as soon as possible after mining commences. Ecological impacts in the hilly forested area to the west should be adequately defined to ensure protection or offset well before underground mining is allowed to commence in this area.*

*Transport of the extracted coal by rail to Port Newcastle is feasible within the existing corridor, and traffic impacts in the Wyong area are acceptable. The economic and social consequences of the proposal are also acceptable.'*

Upon receipt of this report the (then) Department of Planning (DoP) prepared a report on the Project to the Minister for Planning dated March 2011.

In this report the DoP formed the view that the Project should be refused on the following basis;

*'Uncertainty around the subsidence predictions for the project, particularly in the western portion of the site under Jilliby Conservation Area and the Wyong State Forest;*

*The project does not adequately address potential surface water quality impacts, resulting in uncertainty around the ability of the project to meet acceptable water quality outcomes;*

*Uncertainty around the ecological impacts of the project, particularly in the western portion of the site, as a result of a lack of ecological survey effort combined with uncertainty as to subsidence predictions in this area;*

*Uncertainty about the heritage impacts of the project, particularly in the western portion of the site, as a result of a lack of heritage survey effort combined with uncertainty as to subsidence predictions in this area; and*

*In light of the above, the project is not considered consistent with the principles of ecologically sustainable development, including the precautionary principle, and as a consequence is not considered to be in the public interest.'*

As mentioned above, the DG EA Report evinces a clear intention that it does not regard the abovementioned grounds as being absolute and permanent bars to the Project. This intention is made clear in the following passages of the DG EA Report:

*[At page 1:]*

*The Department does not consider that the Proponent has sufficiently demonstrated that the application of adaptive management or management plans is an appropriate response to these uncertainties, and therefore the Department does not consider the application of such an approach for the project to be an appropriate regulatory response to these uncertainties at this point in time.*

*[At page 2:]*

*For these reasons, whilst the Department considers that coal mining could potentially be carried out, the Department is unable to support approval of the project at this time.*

*[At page 27:]*

*Until greater certainty and clarity is achieved for subsidence predictions and consequent ecological impacts in the western, hilly areas of the project site, the Department is not in a position to support mining activities in or close to these areas at this point in time.*

[At page 34:]

*Given the number and significance of unresolved issues associated with the project, the Department cannot support approval of the project application for the Wallarah 2 Coal Project at this time.*

Studies are well underway to provide supplementary information to address the issues raised in the DG EA Report dated March 2011 which was relied on by Minister Kelly for refusing the W2CP Part 3A Approval. These studies will inform the new Wallarah 2 EIS which will be produced for the Project.

The social and economic benefits of the Project are significant:

- During the 3 year construction period, there will be approximately 1,000 direct jobs and up to 800 flow-on jobs each year and a \$1 billion economic stimulus of the regional economy;
- During the approximate 40 year life of mining there would be direct employment of 300 people and approximately 750 flow-on jobs creating an ongoing annual economic contribution to the Central Coast region of \$214 million.

If the Project is approved there would be annual royalties payable to the NSW Government. The quantum accelerates soon after production begins in year 4, to about \$28 million per annum.

WACJV has designed the Project in consideration of environmental and social concerns and with regard to the principles of ESD. No mining will occur under sensitive water features or water supply dams or other infrastructure. All mining will occur within existing proclaimed MSDs.

The Project will provide WACJV with a Development Consent that will enable maximum coal recovery in the most efficient manner utilising current leading practice operational and environmental standards. It will provide WACJV with the flexibility required to ensure that mining is undertaken efficiently whilst also implementing a range of management and mitigation measures to ensure that environmental impacts on sensitive receivers and the environment are minimised.

Areas of environmental impact assessment which were considered, in the opinion of the Minister, to exhibit a degree of uncertainty and therefore have an unresolved level of residual environmental risk will be comprehensively assessed in the Wallarah 2 EIS to ensure that there is a very high degree of certainty over the environmental considerations of the Project.

\* \* \*

for

**HANSEN BAILEY**



Dianne Munro  
Principal



James Bailey  
Director

## 10 ABBREVIATIONS

Abbreviation	Description
AGO	Australian Greenhouse Office
AHIMS	Aboriginal Heritage Information Management System
Approved Method	OEHS 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW'
bcm	bank cubic metres
BoM	Bureau of Meteorology
CEECs	Critically Endangered Ecological Community
CHP	Coal Handling Plant
CMHS Act	<i>Coal Mine Health and Safety Act 2002</i>
Dams Safety Act	<i>Dams Safety Act 1978</i>
DG EA Report	Director General's Environmental Assessment Report (March 2011)
DGRs	Director General's Requirements
DoL	Department of Lands
DP&I	Department of Planning and Infrastructure
DTIRIS – DRE	Department of Trade, Industry Regional Investment and Services – Division of Resources and Energy
ECRTN	<i>Environmental Criteria for Road Traffic Noise 1999</i>
EECs	Endangered Ecological Community
EL	Exploration Licence
EMP	Environmental Monitoring Program
EP&A ACT	<i>Environmental Planning &amp; Assessment Act 1979</i>
EPBC Act	<i>Environmental Protection &amp; Biodiversity Conservation Act 1999</i>
EPI	Environmental Planning Instrument
ESD	Ecologically Sustainable Development
GDEs	Groundwater Dependent Ecosystems
Gunnedah LEP	<i>Gunnedah Local Environmental Plan 1998</i>
LGA	Local Government Area
MNES	Matters of National Environmental Significance
Mt	Million tonnes
Mtpa	Million tonnes per annum
NOW	NSW Office of Water
NPW Act	<i>National Parks and Wildlife Act 1974</i>
OEHS	Office of Environment & Heritage
PFM	Planning Focus Meeting
PM <sub>10</sub>	Particulate Matter of 10 micrometers or less
PM <sub>2.5</sub>	Particulate Matter of 2.5 micrometers or less
POEO Act	<i>Protection of the Environment Operations Act 1997</i>



Abbreviation	Description
Project Boundary	Boundary to which the Development Application Project applies
Roads Act	<i>Roads Act 1993</i>
ROM	Run of Mine
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy
SEWPaC	Federal Department of Sustainability, Environment, Water, Populations and Communities
SIA	Social Impact Assessment
The Project	Project as described in Section 3 this Background Document
tpa	tonnes per annum
tph	tonnes per hour
TSC Act	<i>Threatened Species Conservation Act 1995</i>
TSP	Total Suspended Particles
VPA	Voluntary Planning Agreement
W2CP EA	Wallarah 2 Coal Project Environmental Assessment, International Environmental Consultants, February 2010
WAL	Water Access Licence
Wallarah 2 EIS	Wallarah 2 Environmental Impact Assessment
WM Act	<i>Water Management Act 2000</i>

## 11 REFERENCES

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## **APPENDIX A**

### ***Preliminary Environmental Risk Assessment***

**WALLARAH 2 COAL PROJECT**  
**PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT**  
*for*  
**Wyong Areas Coal Joint Venture**

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
Subsidence	Surface disturbance associated with the subsidence of the land within the zone of influence	Disturbance of the natural environment	3	B	9, High	<p>A Subsidence Impact Assessment will be carried out for the Project which will entail.</p> <ul style="list-style-type: none"> <li>• Identification of potential risks and constraints associated with subsidence associated with the project's longwall coal mining operations;</li> <li>• Overview of the longwall extraction process;</li> <li>• Consideration of the relevant geological, geotechnical and structural characteristics in the Extraction Area;</li> <li>• Modelling of subsidence behaviour using the empirically-based Incremental Profile Method (IPM) and numerical modelling of the specific project area geology and rock behaviour / response in relation to subsidence;</li> <li>• Consideration of and prediction of systematic (vertical subsidence, tilting and strains) and non-systematic (far field movements, upsidence and closure, rock mass disturbance) subsidence movements;</li> <li>• Evaluation of alternative mine layouts;</li> </ul> <p>Review of the relevant statutory context;</p>
		Disturbance of the built environment	3	B	9, High	
	Underground mining resulting in subsidence	Unplanned movement of land resulting in significant environmental effects	3	C	13, High	

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
						<ul style="list-style-type: none"> <li>Consideration of subsidence effects, impacts and consequences in the overall Project environmental assessment and the integration with other key environmental assessment areas such as groundwater, flooding, hydrogeomorphology and ecology;</li> <li>Assessment of impacts on houses, structures, other improvements, soils, steep areas and other natural features, roads, transmission lines, communication cables, other public infrastructure, etc;</li> <li>Rehabilitation and other management requirements; and</li> <li>Monitoring requirements, model validation and adaptive management.</li> </ul> <p>This assessment will entail (among other things) modelling providing predictions on subsidence effects, vertical subsidence, ground movement, upsidence, closure and rock mass disturbance.</p>
Ecology	Vegetation clearing and topsoil stripping associated with surface infrastructure	Loss of biodiversity and disruption to threatened flora and fauna or likely habitats	2	D	12, High	<p>A Flora and Fauna Impact Assessment will be completed for the Project in accordance with (at least) the DECCW <i>Draft Guidelines for Threatened Species Assessment</i>.</p> <p>Database analysis, literature review and field surveys will identify threatened flora and fauna which may be impacted by the Project.</p> <p>Mitigation measures will be determined as necessary for the Project including the development of an offsets strategy, if required.</p>
		Disturbance to listed species, communities or habitat	2	D	12, High	
	Subsidence of land resulting in modified landform	Changes to habitat conditions for flora, fauna and aquatic organisms	2	C	8, High	

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
Aboriginal and Non-Aboriginal Archaeology and Cultural Heritage	Vegetation clearing, drilling and topsoil stripping	Disturbance of Aboriginal artefacts, sites or places of cultural heritage significance	3	C	13, High	An Aboriginal Archaeological and Cultural Heritage Impact Assessment for the Project will be undertaken in accordance with DECCWs <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> .  The Assessment will include a desktop review, database, literature search of previously recorded Cultural Heritage information. A field survey will occur with members of the Aboriginal community. Mitigation and management strategies will be developed as required.
	Surface disturbance associated with the subsidence of the land within the zone of influence	Disturbance of Non-Aboriginal heritage sites	4	D	21, Low	A Non-Aboriginal Heritage Assessment will be completed in accordance with the standards required by the Heritage Office of NSW. The Assessment will include a review of existing heritage assessment reports and a field survey of the Project area. Heritage significance will be assessed. Mitigation measures will be identified and implemented as appropriate for potential impacts.
Water Management	Construction of hardstand areas, stockpiles and dams	Dirty water runoff entering local waterways	2	C	8, High	A Groundwater Impact Assessment will be conducted for the Project. The Groundwater Assessment will include the identification of groundwater resources which may be impacted by the Project, modelling of cumulative groundwater impacts and development of a Groundwater Model for the Project. The Groundwater Assessment will also propose groundwater mitigation and management strategies as required and a post approval Groundwater Management Program.
		Contamination of surface water runoff with sediment and salts	4	C	18, Med	
	Coal extraction	Groundwater inflow into underground workings	3	D	17, Med	A Surface Water Impact Assessment will be conducted for the Project. This Assessment will include a review of existing surface water

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
		Drawdown of aquifers on surrounding water users	3	D	17, Med	assessment reports, the identification of surface water resources, assessment of existing surface water hydrology, assessment of potential surface water impacts on and offsite.  The Surface Water Impact Assessment will also include the development of surface water management strategies, mitigation measures and development of a water balance model for the life of the Project.  A relevant Flooding Impact Assessment will be conducted.
		Cumulative impacts with surrounding users	3	D	17, Med	
	Production	Water demand for dust suppression	2	D	12, High	
	Water discharges into local waterways	Surface water contamination	2	D	12, High	
		Contaminated water from infrastructure	2	D	12, High	
	Subsidence of land resulting in modified landform	Changes to flooding regime	3	B	9, High	
Air Quality	Vegetation clearing and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated dust levels	4	C	18, Med	An Air Quality and Greenhouse Gas Impact Assessment will be conducted for the Project in accordance with the 'Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales' (DEC 2005). The Assessment will include confirmation of background levels, determination of site criteria, construction and operation of air quality impacts, determination of greenhouse emissions, cumulative impacts and a literature review.
	Coal stockpiles		4	B	14, Med	
	Coal processing and transport		3	D	17, Med	
Greenhouse	Coal Seam Gas extraction	Greenhouse gas emissions	3	D	17, Med	The Assessment will also develop any suitable mitigation and management measures needed.
	Combustion of diesel fuel		3	D	17, Med	



Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
	Use of Electricity		4	D	21, Low	The air quality Impact Assessment will assess greenhouse gas Scope 1, 2 and 3 emissions in accordance with the Australian Greenhouse Office's (AGO) 'Factors and Methods Workbook' (AGO, 2005) as part of the Air Quality and Greenhouse Gas Impact Assessment described above.
	Downstream Impacts from the transport and burning of Coal		3	D	17, Med	
Noise	Train movements on rail loop and spur	Excessive Noise Generation	4	C	18, Med	A Noise Impact Assessment will be conducted for the Project by in accordance with (at least) the <i>Industrial Noise Policy 2000</i> .  The Assessment will determine likely criteria for the Project and include an assessment of operational and construction noise impacts, assessment of train movements and noise impacts with approved industry and the assessment of cumulative impacts.  The Noise Impact Assessment will also develop appropriate mitigation and management measures.
	Use of Coal Stockpiles		4	C	18, Med	
	Coal loading at rail loop		4	C	18, Med	
	Product Coal Transport		4	C	18, Med	
	Increased traffic movements		4	C	18, Med	
Visual and lighting	Construction and operation of Coal Stockpiles	Visual impact to surrounding receivers	4	D	21, Low	A Visual Impact Assessment will be completed for the Project to assess the visual impacts of the Project and identify mitigation and management measures, as appropriate.  The Assessment will include analysis of the existing visual setting, definition of preliminary visual impacts and comment on potential cumulative impacts.
	Infrastructure areas and exposed earthworks		4	D	21, Low	
	Use of Lighting at Surface Facilities		3	C	13, High	

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
Socio-Economics	Employees residing in local region	Social Impacts	3	D	17, Med	A social assessment will be prepared for the Project considering the stakeholder engagement program and impacts predicted for the Project. Mitigation measures will be determined as required.
		Economic Impacts	3	D	17, Med	A detailed economics assessment will be completed determining both local and regional impacts from the Project.
Land Management	Topsoil Stripping and land preparation for Surface Facilities	Loss of productive topsoil	4	D	21, Low	A Soils and Land Capability Impact Assessment will be completed for the Project. The assessment will also suggest any required impact mitigation measures.
		Deterioration of land capability	4	E	23, Low	
	Rehabilitation of surface facilities and possible surface cracks	Erosion and sedimentation, agricultural productivity	4	D	21, Low	Final rehabilitation objectives, land use and closure will be assessed. An agricultural productivity assessment will be also included.
		Invasion of weed species or feral animals	4	E	23, Low	
Traffic and Transport	Use of public road/rail facilities by employees, deliveries and train loading	Increased traffic movements on public roads	4	C	18, Med	A Traffic and Transport Impact Assessment will be completed for the Project by in accordance with at least the 'Guide to Traffic Generating Developments'.  The Assessment will include a review of previous traffic impact assessments undertaken for the surrounding area, determination of likely criteria for the Project, design of a traffic counts program, assessment of existing, construction and operational traffic impacts and assessment of traffic movements on existing road networks.
	Road Upgrades	Safety and Public Perception	4	C	18, Med	

Issue	Aspect	Impact	Preliminary Risk Assessment			Environmental Impact Statement Scope
			C	L	R	
						The Assessment will also describe any required impact mitigation and management measures.
Waste Management	Generation of General waste	Land contamination	4	D	21, Low	A relevant waste assessment will be undertaken for the Project and an indicative Waste Management System described which shall provide management procedures to ensure the environmentally responsible disposal, tracking and reporting of all relevant waste generated on site.
	Generation of Sewage	Water contamination	4	D	21, Low	
Hazardous materials	Storage and Handling	Soil and water contamination	4	D	21, Low	A relevant level of hazard assessment in accordance with SEPP 33 will be undertaken for the Project, although it is not anticipated that large quantities of hazardous materials will be required for the Project.
	Bushfire	Fire Hazard	4	D	21, Low	A relevant bushfire hazard assessment will be undertaken for the Project with relevant mitigation defined as required.

**WALLARRAH 2 COAL PROJECT**  
**Risk Assessment Tools**  
**Matrix for Determining Level of Risk**

Likelihood	Consequence				
	1	2	3	4	5
A	1	2	6	10	15
B	3	4	9	14	19
C	5	8	13	18	22
D	7	12	17	21	24
E	11	16	20	23	25

**Risk Rating**

Risk Rating	
1-5	Extreme
6-13	High
14-20	Medium
21-25	Low

## **APPENDIX B**

### ***Instrument of Refusal***

# Project Refusal

## Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, refuse the project application referred to in Schedule 1.

The reasons for refusal of the project application are as follows:

- uncertainty around the subsidence predictions for the project, particularly in the western portion of the site under Jilliby Conservation Area and the Wyong State Forest;
- the project does not adequately address potential surface water quality impacts, resulting in uncertainty around the ability of the project to meet acceptable water quality outcomes;
- uncertainty around the ecological impacts of the project, particularly in the western portion of the site, as a result of a lack of ecological survey effort combined with uncertainty as to subsidence predictions in this area;
- uncertainty around the heritage impacts of the project, particularly in the western portion of the site, as a result of a lack of heritage survey effort combined with uncertainty as to subsidence predictions in this area;
- in light of the above, the project is not considered consistent with the principles of ecologically sustainable development, including the precautionary principle, and as a consequence is not considered to be in the public interest.



3 MAR 2011

The Hon Tony Kelly MLC  
Minister for Planning

Sydney

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### SCHEDULE 1

<b>Application Numbers:</b>	07_0160
<b>Proponent:</b>	Wyong Areas Coal Joint Venture
<b>Approval Authority:</b>	Minister for Planning
<b>Project:</b>	Wallarah 2 Coal Project

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