



BULLI SEAM OPERATIONS

SECTION 1 INTRODUCTION

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1 INTRODUCTION

This document is an Environmental Assessment (EA) for the Bulli Seam Operations (the Project). The Project provides for the continuation of existing underground coal mining operations at the Appin Mine and West Cliff Colliery.

The Appin Mine and West Cliff Colliery are located approximately 25 kilometres (km) north-west of Wollongong in New South Wales (NSW) (Figure 1-1).

The Appin Mine and West Cliff Colliery are owned and operated by Illawarra Coal Holdings Pty Ltd (ICHPL), a wholly owned subsidiary of BHP Billiton Pty Limited.

ICHPL also owns and operates the Dendrobium Mine located approximately 10 km north-west of Wollongong in NSW.

ICHPL has a long history of working in the Southern Coalfield of NSW to provide high-value coking coal to the Australian steel industry and for export to overseas customers. ICHPL provides a significant economic contribution to the region (Illawarra and South Western Sydney, including Wollondilly).

ICHPL is an important employer in the region, through both direct employment of ICHPL staff and employment of local contractors at the Appin Mine, West Cliff Colliery and Dendrobium Mine. The flow-on employment benefits of ICHPL's operations are also significant.

Approval of the Project would secure the future employment of the ICHPL workforce and contractors, sustain the supply of coking coal to the local steel industry and continue to provide significant economic benefits to the region and the state of NSW.

1.1 PROJECT OVERVIEW

1.1.1 Purpose of this Report

This EA has been prepared to accompany a Project Application made for the Project, in accordance with Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act).

The Project was determined to be a "Major Project" to which Part 3A of the EP&A Act applies in accordance with the *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP) by the Director-General of the NSW Department of Planning (DoP), as delegate of the NSW Minister for Planning on 16 August 2008.

This EA considers the potential environmental impacts of the Project in accordance with the Director-General's Environmental Assessment Requirements (EARs) issued by the DoP on 18 August 2008 (Attachment 1).

The EARs were issued in accordance with the requirements of Part 3A of the EP&A Act and Part 1A of the *Environmental Planning and Assessment Regulation, 2000* (EP&A Regulation). A summary of the EARs is provided in Section 1.2.

1.1.2 Background

The past and current underground mining operations (i.e. approved Subsidence Management Plan [SMP] areas) at the Appin Mine and West Cliff Colliery are shown on Figures 1-1 and 1-2. A description of the existing mining operations is provided in Section 2.1.

The operations at the current underground mining areas are supported by three pit tops (i.e. West Cliff, Appin East and Appin West) and other ancillary infrastructure.

Coal extracted from the underground mining operations is transferred to the surface at the Appin East and West Cliff pit tops (Figure 1-2). Run-of-mine (ROM) coal from the Appin East pit top is transported a short distance via public road to the West Cliff Washery. A small amount of ROM coal is also transported via the public road network to the Dendrobium Washery in Port Kembla (Figure 1-1).

ROM coal is reclaimed, crushed, screened and washed at the West Cliff Washery.

Coal wash material from the West Cliff Washery and the Dendrobium Washery is emplaced at the West Cliff Coal Wash Emplacement (Figure 1-2).

Product coal from the West Cliff Washery is transported by road to the Port Kembla Coal Terminal (PKCT) or to the BlueScope Steelworks. Small amounts of product coal are also transported via public roads to the Illawarra Coke Company's Corrimal and Coalcliff Coke Works and other customers.

1.1.3 Project Summary

The Project would involve the continuation of underground mining operations at the Appin Mine and West Cliff Colliery and would extend the current operations by approximately 30 years.

Table 1-1 provides a summary comparison of the existing Appin Mine and West Cliff Colliery operations and the Project components including upgrades.

The main activities associated with the development of the Project would include:

- continued development of underground mining operations within existing coal leases and new mining leases to facilitate a total ROM coal production rate of up to 10.5 million tonnes per annum (Mtpa);
- ongoing exploration activities within existing exploration tenements;
- upgrade of the existing West Cliff Washery to support the increased ROM coal production;
- continued mine gas drainage and capture for beneficial utilisation at the West Cliff Ventilation Air Methane Project (WestVAMP) and Appin-Tower Power Project;
- continued generation of electricity by the existing Appin-Tower Power Project (owned and operated by Energy Developments Limited [EDL]) utilising coal bed methane drained from the underground mine workings;
- upgrade of existing surface facilities and supporting infrastructure (e.g. service boreholes, ventilation shafts, gas drainage equipment, sumps, pumps, pipelines, waste water treatment and waste water disposal);
- continued and expanded placement of coal wash at the West Cliff Coal Wash Emplacement;
- continued road transport of ROM coal from the Appin East pit top to the West Cliff Washery;
- continued road transport of ROM coal via the public road network from Appin East pit top and West Cliff pit top to the Dendrobium Washery at Port Kembla;
- continued road transport of product coal from the West Cliff Washery via the public road network to BlueScope Steelworks, PKCT, Corrimal and Coalcliff Coke Works and other customers;
- ongoing surface monitoring and rehabilitation (including rehabilitation of mine related infrastructure areas that are no longer required) and remediation of subsidence effects; and
- other associated minor infrastructure, plant, equipment and activities.

1.1.4 Site Location and Tenure

The Project is located within the existing mining tenements Consolidated Coal Lease (CCL) 724, CCL 767, CCL 381 and Coal Lease (CL) 388.

A number of existing exploration tenements are also held across the Project area by ICHPL (through subsidiary Endeavour Coal Pty Ltd) and are listed in Table 1-2.

**Table 1-2
Existing Mining and Exploration Tenements**

Mining Tenements	Exploration Tenements
<ul style="list-style-type: none"> • CCL 724 • CCL 767 • CCL 381 • CL 388 	<ul style="list-style-type: none"> • EL 4470 • EL 7249 • AUTH 0199 • AUTH 0201 • AUTH 0248 • AUTH 0306 • AUTH 0312 • AUTH 0370 • AUTH 0395 • AUTH 0396 • AUTH 0397 • AUTH 0432

Source: After ICHPL (2008)

The Project would extend into new Mining Lease Application (MLA) areas as follows (Figure 1-2):

- MLA 1 – within existing Authorisation (AUTH) 0248 and Exploration Licence (EL) 4470 which adjoins CCL 767 to the north-west;
- MLA 2 – within existing EL 7249 which adjoins CCL 767 to the north-east; and
- MLA 3 – adjoining CCL 767 in the south-west.

ICHPL will lodge MLAs with the NSW Department of Primary Industries - Mineral Resources (DPI-MR)¹ for Project areas that are outside the existing mining tenements. ICHPL will also continue to apply for and renew the exploration tenements with the DPI-MR as required.

¹ Effective from 1 July 2009, the NSW Government changed the name of DPI and combined its responsibilities with the energy management responsibilities of the former DWE and the responsibilities of the Department of State and Regional Development, and is now known as the Department of Industry and Investment (DII). However, herein this EA they are referred to as DPI, DWE and the Department of State and Regional Development.

**Table 1-1
Project Summary**

Project Component	Summary of Existing Appin Mine and West Cliff Colliery Operations	Summary of the Project
Underground Mining and ROM Coal Production	<ul style="list-style-type: none"> • Longwall mining methods to extract coal from the Bulli Seam. • ROM coal production of approximately 7.5 Mtpa. • There is no maximum limit on coal production at the current operations. 	<ul style="list-style-type: none"> • Continuation of longwall mining operations to extract coal from the Bulli Seam from the following areas (Figure 1-2): <ul style="list-style-type: none"> - Appin Area 7. - West Cliff Area 5. - Appin West (Area 9). - Appin Area 8. - Appin Area 2 Extended. - Appin Area 3 Extended. - North Cliff. • ROM coal production of up to approximately 10.5 Mtpa.
Coal Washing	<ul style="list-style-type: none"> • The West Cliff Washery has an existing throughput capacity of approximately 6 Mtpa.* 	<ul style="list-style-type: none"> • The West Cliff Washery would be upgraded to increase throughput in line with ROM coal production.*
Product Coal	<ul style="list-style-type: none"> • Production of approximately 5.4 Mtpa of product coal for export and domestic markets. 	<ul style="list-style-type: none"> • Production of up to approximately 9.3 Mtpa of product coal for export and domestic markets.
Pit Top and Surface Stockpiles	<ul style="list-style-type: none"> • West Cliff pit top: <ul style="list-style-type: none"> - ROM and product coal stockpiles. - Coal wash emplacement. • Appin East pit top: <ul style="list-style-type: none"> - ROM coal stockpiles. • Appin West pit top. <ul style="list-style-type: none"> - No coal stockpiles. 	<ul style="list-style-type: none"> • Existing pit top facilities would be utilised where practicable and would be upgraded where required. • The Project would include extensions/upgrades to ROM coal, product coal and coal wash stockpiles and materials handling facilities.
Coal Wash Emplacement	<ul style="list-style-type: none"> • Coal wash produced at the West Cliff Washery and Dendrobium Washery is emplaced at the West Cliff Stage 2 Coal Wash Emplacement. • ICHPL received a Notice of Staged Development Approval for the development of the West Cliff Stage 3 Coal Wash Emplacement on 20 December 2007. 	<ul style="list-style-type: none"> • Coal wash would continue to be produced, with production to increase proportionally with ROM and product coal rate upgrades. • Coal wash produced by the Project would be placed at the West Cliff Stage 3 Coal Wash Emplacement. • Coal wash produced by the Project would be placed at the West Cliff Stage 4 Coal Wash Emplacement. • ICHPL has committed to an underground emplacement trial (Section 2.8.4) and to consider alternative coal wash management options (Section 2.8.5).
General Surface Facilities and Supporting Infrastructure	<ul style="list-style-type: none"> • Existing general surface facilities include administration buildings, coal handling infrastructure, bath house, workshops, equipment service facilities, car park, washdown and fuel storage facilities. • Extensive supporting infrastructure including systems associated with: <ul style="list-style-type: none"> - underground drift access and conveyors; - electricity supply, reticulation and control; and - ventilation and gas management. • Remote services sites existing or under construction for provision of mine services by borehole such as power, compressed air, communication, monitoring, etc. 	<ul style="list-style-type: none"> • Existing surface facilities would be utilised. • The Project would include the upgrade of some infrastructure and progressive construction of additional components as required (e.g. service boreholes, gas drainage equipment, waste water treatment and waste water disposal). • Supporting infrastructure systems would be upgraded as required. • Development of new remote services sites utilising boreholes for installation of down-hole power, compressed air, communication, monitoring, etc.

**Table 1-1 (Continued)
Project Summary**

Project Component	Summary of Existing Appin Mine and West Cliff Colliery Operations	Summary of the Project
Goaf Gas Drainage	<ul style="list-style-type: none"> Progressive installation of goaf gas drainage equipment in accordance with separate Part 3A assessments and approvals. Progressive rehabilitation of goaf gas drainage equipment areas. 	<ul style="list-style-type: none"> Continued progressive installation of goaf gas drainage equipment in accordance with Surface Goaf Gas Drainage Management Plans, prepared to the satisfaction of the Director-General of the DoP (Section 2.5.5). Continued progressive rehabilitation of goaf gas drainage equipment areas. The Project does not include surface goaf gas drainage within the Dharawal State Conservation Area (Section 2.5.5).
Water Management	<ul style="list-style-type: none"> Groundwater inflows to the mine are stored and utilised for underground workings and surface facilities. A network of water storages is utilised to manage surface water that accumulates on-site at the surface facilities. Make-up water demand is met by sourcing groundwater from past workings, surface water runoff recovered from mine operational areas and purchase from Sydney Water as required. 	<ul style="list-style-type: none"> Continued use and (where required) upgrade of existing water management infrastructure.
Monitoring of Subsidence Impacts	<ul style="list-style-type: none"> Monitoring of subsidence and subsidence impacts over current and previously mined areas (e.g. subsidence monitoring [ground movement], ecological monitoring and surface water and groundwater monitoring), including the use of reference sites/areas. 	<ul style="list-style-type: none"> Continued monitoring of subsidence and subsidence impacts over the extent of longwall mining areas, including the use of reference sites/areas.
Exploration	<ul style="list-style-type: none"> Exploration activities (e.g. borehole and in-seam drilling, seismic and aeromagnetic surveys). 	<ul style="list-style-type: none"> Continued exploration activities within existing exploration and mining tenements.
Rehabilitation and Remediation Works	<ul style="list-style-type: none"> Surface rehabilitation of West Cliff Coal Wash Emplacement and other progressive surface disturbance areas (e.g. exploration drill pads). Remediation of previously mined areas impacted by subsidence effects, where required. 	<ul style="list-style-type: none"> Continued surface rehabilitation, mitigation and remediation works. Rehabilitation of mine related infrastructure areas that are no longer required.
Life of Mine	<ul style="list-style-type: none"> The Appin Mine and West Cliff Colliery require approval under Part 3A of the EP&A Act by August 2010 to facilitate ongoing operations. 	<ul style="list-style-type: none"> Current mine planning indicates an additional operational life of at least 30 years.
Employment	<ul style="list-style-type: none"> The Appin Mine and West Cliff Colliery currently have a combined operational workforce (employees and on-site contractors) of approximately 875 people. 	<ul style="list-style-type: none"> Long-term employment of 1,170 employees and contractors. It is anticipated that a short-term construction workforce of up to 100 employees would be required at various stages of the Project life.
Hours of Operation	<ul style="list-style-type: none"> 24 hour operations, seven days a week. 	<ul style="list-style-type: none"> 24 hour operations, seven days a week.

* ICHPL submitted a separate Part 3A application (the West Cliff Washery Reliability Improvement Project) – these proposed Washery upgrades have also been considered as a component of the Project (Section 2.4.3). The West Cliff Colliery CPP Project was approved by the NSW Minister for Planning on 17 August 2009 (Project Approval 08_0243).

The Project Application Area includes those lands listed in the real property descriptions provided in support of the Project Application submitted to the DoP (Attachment 2).

A description of the land zoning in the Project Application Area is provided in Section 7.2 and Attachment 5.

1.1.5 Proponent

The Project is being developed by ICHPL, a wholly owned subsidiary of BHP Billiton Pty Limited:

BHP Billiton Illawarra Coal Holdings Pty Ltd
Post Office Box 514
UNANDERRA NSW 2526
Telephone: (02) 4255 3200

At all relevant times in relation to the Project, ICHPL will be acting as agent for and on behalf of Endeavour Coal Pty Ltd in respect of all mining and exploration tenements held by Endeavour Coal Pty Ltd.

1.2 ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The EARs for the Project were issued by the Director-General of the DoP on 18 August 2008 (Attachment 1).

A summary of the EARs is provided in Table 1-3. Table 1-3 also provides the relevant section of the EA where the EARs are addressed.

1.3 SOUTHERN COALFIELD INQUIRY AND PANEL REPORT RECOMMENDATIONS

On 6 December 2006, the NSW Government established an independent inquiry into underground coal mining in the Southern Coalfield and appointed an independent expert panel (the Panel) to conduct the inquiry. Following appointment, the Panel held briefing sessions with relevant Government agencies (including DPI-MR, NSW Department of Environment and Climate Change [DECC]², Sydney Catchment Authority [SCA] and NSW Department of Water and Energy [DWE]), industry groups (including the NSW Minerals Council and mining companies active in the Southern Coalfield) as well as community and non-government organisations.

² Effective from 1 July 2009, the NSW Government changed the name of the DECC, and combined its responsibilities with the water management responsibilities of the former DWE, and is now known as the NSW Department of Environment, Climate Change and Water (DECCW). However, herein this EA they are referred to as the DECC and DWE.

The Panel, through the DoP, advertised the terms of reference and asked for written submissions from the wider community as well as offering the opportunity for presentations to be made before the Panel at public hearings. The Panel held public hearings in Camden from 18 to 21 September 2007.

The Panel's final report *Impacts of Underground Coal Mining on Natural Features in the Southern Coalfield Strategic Review* (herein referred to as the Southern Coalfield Panel Report [SCPR]) was released by the DoP on 10 July 2008 (DoP, 2008).

The SCPR recommendations have been considered in the preparation of this EA.

1.4 PROJECT CONSULTANTS

This EA was prepared by Resource Strategies Pty Ltd with specialist input provided by the following organisations and individuals:

- ICHPL project team (*project design, alternatives and justification, preliminary hazard analysis, environmental risk assessment, background data, road transport assessment, resource economics, consultation, mine closure, rehabilitation and Statement of Commitments*);
- Mine Subsidence Engineering Consultants (MSEC) (*subsidence assessment*);
- Heritage Computing (*groundwater assessment*);
- Gilbert & Associates Pty Ltd (*surface water assessment*);
- Bio-Analysis Pty Ltd (*aquatic ecology assessment*);
- FloraSearch (*terrestrial flora assessment*);
- Biosphere Environmental Services Pty Ltd (*terrestrial fauna assessment*);
- Biosis Research Pty Ltd (*Aboriginal cultural heritage assessment*);
- Heritage Management Consultants Pty Ltd (*non-Aboriginal heritage assessment*);
- Wilkinson Murray (*noise impact assessment*);
- Holmes Air Sciences (*air quality impact assessment*);
- Traffix (*road transport assessment*);
- Gillespie Economics (*socio-economic assessment*);
- SP Solutions (*environmental risk assessment*);
- Dr Barry Noller (*surface water quality analysis*); and
- Minter Ellison (*legal review*).

**Table 1-3
Director-General’s Environmental Assessment Requirements – Reference Summary***

Summary of Environmental Assessment Requirements	EA Reference
General Requirements	
The Environmental Assessment (EA) must include:	
<ul style="list-style-type: none"> Executive Summary. 	Front of EA
<ul style="list-style-type: none"> Description of the Appin Mine and West Cliff Colliery and any associated coal wash emplacement areas including historical and existing mining operations, facilities, environmental management and monitoring. 	Sections 1, 2 and 5
<ul style="list-style-type: none"> Description of the Project. 	Section 2
<ul style="list-style-type: none"> Project justification and alternatives considered. 	Section 7 and Appendices A and L
<ul style="list-style-type: none"> Risk assessment of the potential environmental impacts of the Project. 	Sections 5.1, 5.2, 5.18 and Appendices N, O, P, Q and R
<ul style="list-style-type: none"> Description of the existing environment. 	Section 5
<ul style="list-style-type: none"> Assessment of the potential environmental impacts of all stages of the Project, including cumulative impacts. 	Section 5
<ul style="list-style-type: none"> Consideration of relevant guidelines, policies, plans and statutory provisions and the findings and recommendations of the Southern Coalfield Inquiry. 	Section 7 and Appendices A to R
<ul style="list-style-type: none"> Description of the measures to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the Project including contingency plans. 	Sections 4, 5, 6 and 8
<ul style="list-style-type: none"> Statement of Commitments. 	Section 8
<ul style="list-style-type: none"> A conclusion justifying the Project on economic, social and environmental grounds, taking into consideration whether the project is consistent with the objects of the EP&A Act. 	Section 7 and Appendix L
<ul style="list-style-type: none"> Certification by the author of the EA. 	Front of EA
Key Issues	
<ul style="list-style-type: none"> Subsidence. 	Section 5.4 and Appendix A
<ul style="list-style-type: none"> Soil and Water. 	Sections 5.3, 5.5 and 5.6 and Appendices B and C
<ul style="list-style-type: none"> Biodiversity. 	Sections 5.7, 5.8 and 5.9 and Appendices D, E and F
<ul style="list-style-type: none"> Heritage. 	Sections 5.10 and 5.11 and Appendices G and H
<ul style="list-style-type: none"> Noise. 	Section 5.12 and Appendix I
<ul style="list-style-type: none"> Air Quality. 	Section 5.13 and Appendix J
<ul style="list-style-type: none"> Greenhouse Gas. 	Section 5.14 and Appendix J
<ul style="list-style-type: none"> Transport. 	Section 5.15 and Appendix K
<ul style="list-style-type: none"> Waste. 	Section 2.12
<ul style="list-style-type: none"> Hazards. 	Section 5.18 and Appendix M
<ul style="list-style-type: none"> Rehabilitation. 	Section 6
<ul style="list-style-type: none"> Social and Economic. 	Sections 5.16 and 5.17 and Appendix L
Consultation Requirements	
<ul style="list-style-type: none"> Describe consultation with relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners. 	Section 3 and Attachment 4
<ul style="list-style-type: none"> The consultation process, and the issues raised during this process, must be described in the EA. 	Section 3

* The complete version of the EARs is presented in Attachment 1.

In addition to the above, Peer Review was undertaken by the following specialists:

- Dr Frans Kalf (*groundwater assessment*);
- Dr Tom McMahon (*surface water assessment*);
- Dr David Goldney (*terrestrial flora, terrestrial fauna and aquatic ecology assessments*);
- Mr Robert (Ben) Gunn (*Aboriginal cultural heritage assessment*); and
- Dr John Rolfe (*socio-economic assessment*).

1.5 STRUCTURE OF THIS DOCUMENT

This EA comprises a main text component and supporting studies, which include Appendices A through R. An overview of the main text is presented below:

Section 1	Provides an introduction to the Project and the EA.
Section 2	Describes the various components of the Project.
Section 3	Describes the consultation undertaken in relation to the EA and ongoing community involvement.
Section 4	Outlines the framework of the environmental assessment, particularly in regard to the Metropolitan Coal Project Review Report (Planning and Assessment Commission [PAC], 2009).
Section 5	Details the environmental assessment for the Project including a description of the existing environment, assessment of potential impacts and a description of measures that would be implemented to avoid, minimise, mitigate, offset, manage and/or monitor the impacts of the Project.
Section 6	Describes rehabilitation and mine closure.
Section 7	Outlines the statutory provisions relevant to the Project, describes the alternatives considered and provides a Project justification.
Section 8	Provides ICHPL's Statement of Commitments including a summary of the proposed environmental management, monitoring and reporting and specific environmental commitments in relation to the Project.

Section 9 Lists documents referenced in Sections 1 to 8 of the EA.

Section 10 Defines abbreviations, acronyms and terms used in Sections 1 to 8 of the EA.

Attachments to the main text are also provided as follows:

Attachment 1	Director-General's Environmental Assessment Requirements.
Attachment 2	Project Application Area and Real Property Descriptions.
Attachment 3	Peer Review Letters.
Attachment 4	Consultation Newsletters and Leaflets.
Attachment 5	Relevant Local Government Planning Instruments.
Attachment 6	Dharawal State Conservation Area Memorandum of Understanding.

Appendices A to R contain supporting documentation, including a number of specialist reports:

Appendix A	Subsidence Assessment.
Appendix B	Groundwater Assessment.
Appendix C	Surface Water Assessment.
Appendix D	Aquatic Ecology Assessment.
Appendix E	Terrestrial Flora Assessment.
Appendix F	Terrestrial Fauna Assessment.
Appendix G	Aboriginal Cultural Heritage Assessment.
Appendix H	Non-Aboriginal Heritage Assessment.
Appendix I	Noise Impact Assessment.
Appendix J	Air Quality Impact Assessment.
Appendix K	Road Transport Assessment.
Appendix L	Socio-Economic Assessment.
Appendix M	Preliminary Hazard Analysis.
Appendix N	Environmental Risk Assessment.
Appendix O	Upland Swamp Risk Assessment.
Appendix P	Stream Risk Assessment.
Appendix Q	Aboriginal Heritage Site Risk Assessment.
Appendix R	Major Cliff Line Risk Assessment.