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ILLAWARRA COAL

ENVIRONMENTAL ASSESSMENT
West Cliff Coal Preparation Plant Raw Coal Circuit and Reliability Improvement Project

May 2009

Cardno Forbes Rigby Reference 109010-02 Report 001 Rev 2

STATEMENT OF CERTIFICATION

Environmental Assessment prepared under

Part 3A of the Environmental Planning and Assessment Act 1979

Environmental Assessment Prepared by:

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Project to which the Environmental Assessment relates:

Project Description:	West Cliff Coal Preparation Plant Raw Coal Circuit & Reliability Improvement Project.

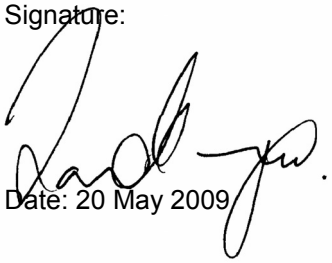
Applicant's Name:	BHP Billiton Illawarra Coal
Applicant's Address:	BHP Billiton Illawarra Coal Administration Centre Old Port Road Port Kembla NSW 2505

Certification:

I certify that I have prepared this Environmental Assessment and to the best of my knowledge:

- It has been prepared in accordance with Part 3A of the EPAA 1979 and the Regulations
- It has been prepared in accordance with the Director General Requirements dated 22 December 2008.
- It does not contain information that is either false or misleading.

Signature:



Date: 20 May 2009

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EXECUTIVE SUMMARY

BHP Billiton Illawarra Coal (BHPBIC) operate West Cliff Coal Preparation Plant (CPP), located approximately 4km south of Appin. The CPP processes run of mine coal from two of BHPBIC's Collieries, West Cliff and Appin.

The overall coal supply chain must reliably operate to process the output from the mines to allow BHPBIC to meet customer demands. BHPBIC has reviewed the coal supply chain and identified that the reliability of the CPP requires addressing to ensure it can consistently process the coal produced from the two mines

If BHPBIC does not address CPP reliability, the coal from Appin and West Cliff Collieries may have to be stockpiled to wait processing, due to unforseen breakdowns and delays. This slows the coal supply chain, adds inefficiencies and GHG emissions into the system, which has negative environmental impacts as additional machinery, electricity, and diesel consumption is required. Not progressing with reliability improvements has the potential to affect customers, employees, the environment and the economy.

The main objective of this project is to ensure the reliability of the CPP. To achieve this BHPBIC have reviewed four options. These are:

1. *Replace existing CPP equipment*
2. *Implement an additional stand-alone CPP close to the existing CPP*
3. *Improve reliability or expand the BHPBIC Dendrobium CPP at BlueScope Steel industrial precinct*
4. *Take no action and rely on the existing West Cliff Colliery CPP to operate without failure.*

BHPBIC wish to progress option 1 as this makes best use of existing equipment and infrastructure whilst only proposing new reliability improvements at the existing CPP. This minimises site coverage and impact on the natural environment, by using existing site environmental protection measures and the already disturbed CPP footprint area.

The Department of Planning (DoP) confirm the proposal is a Major Project and assessment under Part 3A of the Environmental Planning & Assessment (EP&A) Act 1979 is required. DoP issued the Director-General's Requirements (DGR's) on the 22 December 2008.

This Environmental Assessment (EA) describes the proposal, identifies benefits and assesses the applicable regulatory framework. The EA also describes consultation with stakeholders and engages the Appin residential community through an existing working group.

This EA assesses potential environmental impacts of the project in accordance with the DGR's and an Environmental Risk Assessment. Key and secondary environmental impacts are assessed based on the expected level of impact.

Key environmental impacts assessed in this document are:

- ***Soil & Water Quality** – impacts will be controlled and mitigated by existing systems*
- ***Air Quality** – minimal impact due to dust suppression systems.*
- ***Noise** - will be generated by the new equipment but impacts are minimal due to distance from sensitive receivers*
- ***Waste** – impacts will be controlled and mitigated by existing systems*
- ***Greenhouse Gas & Energy Use** – GHG emissions from the project will be minimal.*

Secondary environmental impacts assessed are:

- *Ecology*
- *Heritage*
- *Visual*
- *Contamination*
- *Utilities.*

This EA concludes the project proposes no significant environmental impacts and adequate control of impacts is achieved by existing environmental control measures at West Cliff Colliery. The Statement of Commitments ensures new short-term mitigation measures where necessary and the retention of existing mitigation measures.

BHPBIC are also preparing an application under Part 3A of the EP&A Act for ongoing mining operations at West Cliff & Appin Collieries (The Bulli Seam Project). As these timeframes do not fit within the shorter timeframes required for the CPP reliability project, this application is being submitted. It is envisaged that the Bulli Seam project will supersede any approvals granted for this project.

The minimal environmental impacts and the business certainty provided by increased reliability at the West Cliff CPP justify support for the proposed works.

1. INTRODUCTION

This section describes the background to the proposal and the reason for change.

1.1. BACKGROUND

BHP Billiton Illawarra Coal Pty Ltd (BHPBIC) currently operates West Cliff Coal Preparation Plant (CPP), which is the subject of this proposal. West Cliff CPP is located off Wedderburn Road approximately 4km south of Appin, within the Wollondilly Shire local government area (refer **Figure 1**). The CPP is located within Mining Purposes Lease (MPL) 1414, which forms part of Consolidated Coal lease (CCL) 724. The construction, maintenance and operation of a coal preparation plant is permissible under the conditions of CCL724.

BHPBIC carry out underground mining activities at West Cliff & Appin Collieries. These collieries and the ancillary coal supply chain provide a significant economic contribution within the Illawarra and MacArthur Regions. Illawarra Coal generates employment for approximately 2,000 direct employees and contractors throughout its operations. In addition, the local supply of coking coal from Illawarra Coal's mines secures the jobs of employees and contractors at the Port Kembla Steelworks. BHPBIC is a major contributor to the economy of the local region and New South Wales.

The West Cliff CPP processes raw coal mined from both West Cliff & Appin collieries. Once processing is complete, the coal is loaded on trucks for transportation to Port Kembla Coal Terminal (PKCT), BlueScope Steel and other local customers.

BHPBIC propose new equipment (including some replacements) in the CPP to ensure reliability in processing the output from the two collieries. The majority of the new equipment is to be located in extensions to the southern end and the western side of the existing CPP building. Additional new equipment will also be located within the existing CPP building as part of this project. BHPBIC also propose to replace the existing maintenance building because it is in the way of the proposed southern CPP extension and remove a stack out conveyor as the reliability works make it redundant.

The current nameplate capacity of the West Cliff CPP is 7.35 MTPA. The plant cannot sustain the current nameplate rate due to variations in the ROM coal feed material (particularly related to size but also other coal properties). The introduction of modern and more reliable equipment will address these issues. The capacity of the West Cliff CPP post the project implementation will be 7.5 MTPA, therefore, the works for the Reliability Project will not significantly increase the capacity of the West Cliff CPP.

West Cliff CPP throughput is also aligned to the ability of the longwall operations at Appin and West Cliff Mines to deliver planned coal mining rates from their respective mining domains. The previous longwall domains for Appin Mine have resulted in reduced annual ROM production compared with previous levels. BHPBIC expects increased longwall tonnage as longwall layouts become more efficient. As such, implementation of the West Cliff CPP Reliability Project does not in itself significantly change the total volume of ROM coal processed at the West Cliff Coal Preparation Plant. In the current configuration of BHPBIC's Bulli Seam operations, throughput at the West Cliff CPP is solely determined by production at West Cliff and Appin Mines. The previous peak quarterly production at Appin and West Cliff combined was 2.0 MT ROM while the peak annual production was 5.8 MT ROM.

BHPBIC is seeking Major Project Approval from the Minister for planning under Part 3A of the Environmental Planning & Assessment (EP&A) Act 1979 for the continuation of

underground mining operations within the Bulli Seam at the Appin and West Cliff Mines. This includes mining into new mine development areas with significantly improved longwall layout efficiency. This Project Approval is known as the 'Bulli Seam Part 3A'.

The Bulli Seam Project seeks to extend the life of the existing Bulli Seam longwall mining operations by approximately 30 years. The Bulli Seam Project seeks a maximum ROM extraction rate of 10.5 MTPA. The proposed West Cliff CPP Reliability Project does not deliver sufficient capacity to process the proposed maximum ROM extraction rate of 10.5 MTPA. Assessment of further capacity upgrades to the West Cliff CPP is required in the future to achieve the proposed level of production form part of the Bulli Seam Project Environmental Assessment.

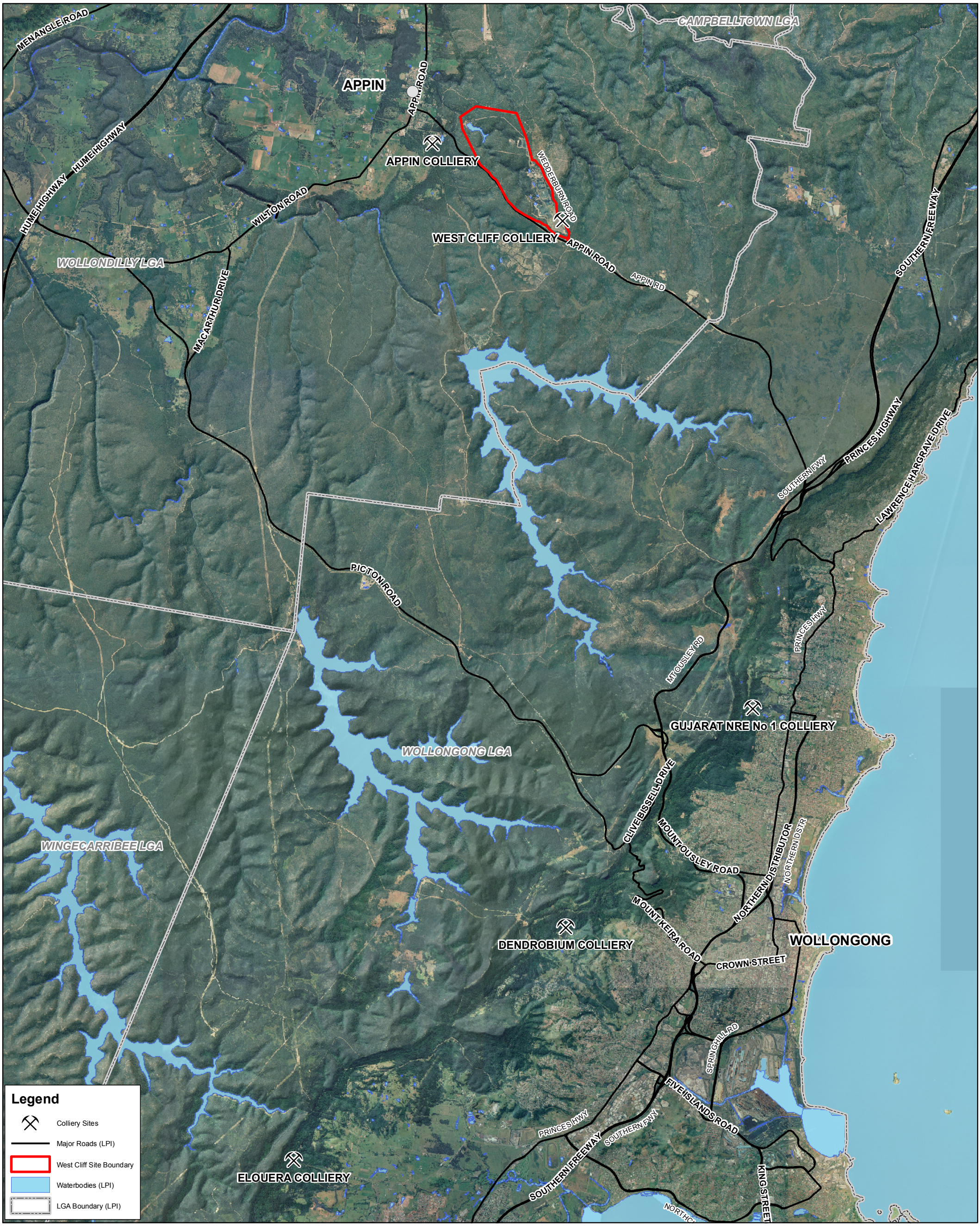
BHPBIC has commissioned Cardno Forbes Rigby (Cardno) to carry out this Environmental Assessment (EA) in relation to the proposed CPP project.

1.2. MAJOR PROJECT CLASSIFICATION

The DoP has reviewed the Preliminary Environmental Assessment (PEA) and accepted the Part 3A application to which State Environmental Planning Policy (SEPP) (Major Projects) 2005 applies. Due to this, the Planning Minister will assume the responsibility of consent authority.

1.3. DIRECTOR-GENERAL'S REQUIREMENTS

The DoP provided the Director-General's Requirements (DGR's) on the 22 December 2008. The DGR's are included in full in **Appendix A**, and **Table 1.1** presents a summary. This table also provides information on the section of this Environmental Assessment that addresses each DGR.



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Scale 1:100,000 (at A3)

Kilometres 0 2 4

Location of West Cliff Colliery

FIGURE 1

N W E S

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby
Date: 24 February 2009
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109010-02_2804_CollieryLocation.mxd 01

Table 1.1 – Director-General's Requirements

Requirement	Comments & Location in EA
General Requirements	
A detailed description of the project, including the need for the project.	Detailed Project Description – **Section 4.3** Need for facility – **Section 5.1** Facility design plan – **Appendix B**
A detailed assessment of the key issues specified below, which includes: • A description of the existing environment • An assessment of the potential impacts of the proposal taking into consideration any relevant policies, guidelines and statutory provisions • A description of the measures that would be implemented to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project.	Existing environment – **Sections 1.1 & 4.1** Policies, guidelines & statutory provision assessment – **Section 2** Measures to reduce project impacts – **Sections 7 & 8** (generally) & **Section 8.7** (specifically)
A general assessment of any other potential impacts of the project.	Assessment of other potential impacts – **Section 8**
A statement of commitments outlining the proposed environmental management and monitoring measures.	Statement of commitments – **Section 10**
A conclusion justifying the proposal, taking into consideration whether it is consistent with the objects of the Environmental Protection & Assessment Act (EPAA) 1979.	Conclusion – **Section 11**
A signed statement from the author of the EA certifying that the information contained within the document is neither false nor misleading.	Signed statement – directly after front cover
Key Issues	
Design – including plans and elevations to the southern end and western side of the existing CPP building.	**Section 4.3** & **Appendix B**
Soil & Water – including the proposed sediment controls during construction, stormwater management once constructed and wastewater management during operation.	**Section 7.3**
Air Quality – demonstrate that all reasonable and feasible measures have been incorporated to minimise dust impacts during construction and operation.	**Section 7.4**
Noise – including any potential noise impacts during construction and operation.	**Section 7.5**
Waste – including management of waste during construction and operation	**Section 7.6**
Greenhouse Gas & Energy Use – including: • A quantitative assessment of the greenhouse gas emissions of the project and qualitative assessment of the potential impacts of these emissions on the environment • A detailed description of the measures that would be implemented on the site to ensure that the project is energy efficient.	**Section 7.7**
• During the preparation of the EA you should consult with relevant local, State or Commonwealth Government Authorities, service providers, community groups or affected landowners.	**Section 3**

1.4. COMPONENTS & STAGING

The proposal has two key work components:

1. Coarse Coal Circuit - proposed to be located in an extension to the south side of the existing CPP
2. Froth Flotation Circuit – proposed to be located in an extension to the west side of the existing CPP.

Secondary work components are:

1. Band Press Filter
2. Horizontal Belt Filter
3. Maintenance building
4. Conveyor Co 6/21 & rill tower.

There is no construction staging of the project. Implementation of the proposed equipment will occur in a single development phase.

1.5. ANTICIPATED TIMING

BHPBIC aim to implement the project at the earliest opportunity to ensure no impacts on the coal supply chain by the ability to process coal. **Table 1.2** shows the programme of works and proposed indicative timing:

Table 1.2 – Anticipated Timing of the Part 3A Application

Stage		Due Date
1.	Prepare Preliminary Environmental Assessment	October 2008
2.	Submit PEA to Department of Planning	Start November 2008
3.	Director-General's Requirements	End December 2008
4.	Submission of Environmental Assessment to DoP for Adequacy Review	March 2009
5.	Commence Public Exhibition and Agency Consultation	May 2009
6.	Completion of DoP assessment	Start July 2009
7.	Minister's Decision	End July 2009

1.6. STRUCTURE OF THIS REPORT

The report structure is as follows:

- **Section 2** – assesses the proposed development against planning policies relating to the proposed development
- **Section 3** – details consultation carried out and responses received
- **Section 4** – explains the CPP operations and describes the proposed developments
- **Section 5** – justifies the proposed development
- **Section 6** – provides an environmental risk assessment

- **Section 7 -** assesses the proposed development against key environmental impacts and identifies proposed mitigation measures
- **Section 8** – assesses the proposed development against secondary environmental impacts and identifies mitigation measures
- **Section 9** – identifies construction safety for the project
- **Section 10** – provides the statement of commitments
- **Section 11** - concludes the EA
- **Section 12** – lists the references used in the preparation of this report.

2. REGULATORY FRAMEWORK

This section outlines the current regulatory framework within which BHPBIC operate and assesses relevant policies.

2.1. FEDERAL LEGISLATION

2.1.1. Environmental Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) applies to matters of national environment and heritage significance. This Act requires approval from the Department of the Environment, Water, Heritage and the Arts for any action that has, will have, or is likely to have a significant impact on the seven listed matters of national environmental significance.

The seven matters are:

1. World Heritage properties
2. National Heritage places
3. Wetlands of international importance
4. Threatened species and ecological communities
5. Migratory species
6. Commonwealth marine or land areas
7. Nuclear actions (including uranium mining).

West Cliff Colliery is not a World Heritage site, a National Heritage place or a wetland. As the CPP site is highly disturbed, it provides limited habitat for threatened species, ecological communities or migratory species. The colliery is not within or adjacent to a Commonwealth marine or land area and no nuclear actions are in operation or proposed.

Numerous flora, fauna and cultural heritage studies have been completed for various proposals at the West Cliff pit top and the location of protected species are well documented. No threatened species are impacted by this proposal. It is highly unlikely that the extensions to the CPP will impact any threatened avian species that may migrate through the area.

A review of these studies concludes that the proposed development does not require further assessment under the EPBC Act 1999.

2.2. NSW LEGISLATION

This section provides an assessment of relevant state planning controls and strategic planning guidance.

2.2.1. Environmental Planning & Assessment Act 1979

The *Environmental Planning and Assessment* (EP&A) *Act 1979* prescribes the planning process for the consideration of all developments within New South Wales. The Department

of Planning administers this Act and it defines the relevant consent authority for proposed developments.

The EP&A Act defines numerous objectives. The objectives relevant to the proposed implementation of the reliability project at the West Cliff CPP are to encourage:

- The proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment
- The promotion and co-ordination of the orderly and economic use and development of land
- Protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats
- Ecologically sustainable development (ESD)
- The sharing of the responsibility for environmental planning between the different levels of government.

The proposed implementation of the reliability project at the West Cliff CPP conserves resources by extending the existing facility rather than implementing a new plant on additional land. The extension of the existing CPP and use of disturbed land assists in the protection of the environment.

The proposed design of the development meets the targets of ESD. BHPBIC has assessed various development options and the proposed development has the least risk and impact on the surrounding environment.

This assessment shows that the CPP reliability project accords with the objects of the EP&A Act.

2.2.2. Mining Act 1992

The Mining Act 1992 currently regulates activities carried out at West Cliff Colliery. The Act requires individuals or companies to obtain approval for exploration, leases relating to mining activities and directs matters that the Minister must take into account prior to granting an authority to carry out mining activities. It also controls exploration and mining activities through consent conditions.

Part 11 of the Mining Act relates to the protection of the environment. Clause 238 empowers the Minister, or delegated consent authority, to include conditions on any exploration or mining authority to ensure the protection of flora, fauna, fish, fisheries, scenic attractions and features of Aboriginal, architectural, archaeological, historical or geological interest. Clause 239 of the Mining Act requires conditions relating to the rehabilitation of land affected by exploration or mining to be included on any consent.

West Cliff Colliery operates under Consolidated Coal Lease (CCL) 724 that incorporates Mining Purposes lease (MPL) 1414. CCL 724 prescribes permissible activities at the West Cliff Surface Facilities. Constructing, maintaining or operating a coal preparation plant is permissible under the conditions of CCL 724. Existing operations at the Colliery are in

accordance with the terms and conditions of these leases. The proposed development to the CPP is in accordance with, and required for, normal mine related operations.

A condition of CCL 724 is that BHPBIC maintain a Mining Operations Plan (MOP). The West Cliff Colliery MOP includes the CPP. The reliability project will require a MOP amendment. BHPBIC provides annual compliance reports in accordance with the MOP through the Annual Environmental Management Report (AEMR).

CCL 724 also requires that BHPBIC prepare a rehabilitation plan for the mine. An approved rehabilitation plan for West Cliff Colliery, dated December 2006, already exists. The plan specifies works required to re-instate the colliery to a natural state, and includes:

- Demolition and removal of buildings and structures
- Identification and remediation of land contamination
- Re-profile of site to original land form
- Revegetation as per plan using native species
- Environmental monitoring for a 5-year period after mine closure.

BHPBIC will amend the West Cliff Colliery rehabilitation plan to include the proposed CPP reliability project development. The expectation is that the following process for the rehabilitation of the CPP site will be appropriate:

- Demolish and remove all structures, drainage, hard standings and works associated with the CPP
- Identify and remediate any land contamination
- Re-profile the site to a natural landform
- Revegetate the site with appropriate native vegetation
- Monitor the site for a 5-year period to ensure rehabilitation is successful.

The Mining Act does not prohibit the development of the proposed facility. The areas to accommodate the reliability project do not contain any flora or fauna with high ecological value. As the land has been significantly disturbed, there is no impact on aboriginal archaeological deposits. Furthermore, there will be no impact on any of the other matters (detailed above) which are regulated by the Mining Act.

The Mining Act does not provide specific approval for the implementation of the proposed works. Additionally, from 1 August 2010 onwards planning approval of all mines will be under the EP&A Act via approvals under Part 3A. BHPBIC are preparing their Part 3A application for ongoing mining activities at West Cliff and Appin Collieries, this is called the 'Bulli Seam' Major Project. The approval of this application will supersede controls of West Cliff via the Mining Act.

2.2.3. Protection of Environment Operation Act 1997

The *Protection of Environment Operation* (POEO) *Act 1997* is the key piece of the NSW Government's legislation to protect the environment. The Department of Environment and Climate Change (DECC) administer this Act. The POEO Act permits the granting of Environmental Protection Licences (EPL) to regulate industrial activity.

BHPBIC holds EPL 2504 for West Cliff Colliery pit top. This stipulates conditions on colliery activities in order to protect the environment. The proposed reliability project for the CPP will not have any impacts on continued operation of the EPL requirements, as the facility will continue to operate within existing environmental controls. It is not envisaged that any variation to the EPL will be required for the CPP reliability project.

Environmental assessments in **Section 7 & 8** demonstrate that the reliability project works have minimal environmental impacts.

2.2.4. National Parks & Wildlife Act 1974

The DECC administer the *National Parks & Wildlife Act* (NP&W Act) 1974. This act manages:

- Conservation of nature
- Conservation of objects, places and features of cultural value
- Public appreciation, understanding and enjoyment of nature and cultural heritage
- Land reserved under this Act.

When determining applications under this Act the consent authority must consider these objectives, the public interest, and appropriate management of the subject land of the application. This Act controls activities in designated Parks, Reserves and Aboriginal areas.

The NP&W Act does not affect the proposed CPP reliability works because the proposed works will not be within a park, a reserve or a heritage area designated under Part 4 of the Act. The two locations for the extensions to the CPP have been significantly disturbed from pit top activities and do not provide habitat for protected flora or fauna. This ensures the proposed activities are in compliance with Parts 7, 8, and 8A of the NP&W Act.

Due to BHPBIC mining activities at the West Cliff pit top numerous Aboriginal cultural heritage assessments have been completed. Whilst these do not focus on the specific locations for the CPP extensions Archaeologists that conducted the studies, advise there are no places, and that it is very unlikely that there are any items of value, listed under Part 6 of the NP&W Act in the proposed work areas. If construction works discover an aboriginal artefact, work will cease and contact made with the Department of Environment and Climate Change.

Further assessment is not required because the proposed development does not have any impacts on matters under this Act.

2.2.5. Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act* (TSC Act) protects threatened species, communities and critical habitat in New South Wales. This Act protects species, populations and ecological communities that are considered endangered, vulnerable or extinct.

Rigorous assessment of activities that may have an impact on protected animals, plants or locations ensures justifications are strong enough to permit the impact to progress. The TSC Act links with the EP&A Act to ensure consideration of these matters during the determination of a development application.

The area to be disturbed is small and the specific locations for development activities do not contain any:

- Endangered species, populations or communities listed in Schedule 1 of the TSC Act
- Critically endangered species or ecological communities listed in Schedule 2 of the TSC Act
- Vulnerable species or ecological communities listed in Schedule 3 of the TSC Act.

Seven-part tests and Species Impact Statements are not required under Part 3A of the EP&A Act for the proposed CPP reliability project. This is because the location of the works will not affect any threatened species, population or community.

As the proposed activity will not have any impact on matters relating to the TSC Act a licence under Part 6 is not required.

2.3. STATE ENVIRONMENTAL PLANNING POLICIES

2.3.1. State Environmental Planning Policy (Major Projects) 2005

The DoP has confirmed that an application under Part 3A of the EP&A Act is the appropriate method to achieve approval for the proposed CPP reliability project and has issued the DGR's. The Director-General of DoP has declared the proposed works are a 'Major Project' under SEPP (Major Projects) 2005, and as such, is the consent authority on behalf of the Minister for Planning.

2.3.2. State Environmental Planning Policy (Mining, Petroleum, Production & Extractive Industries) 2007

This SEPP is in place due to the importance of mining to NSW. It sets out aims and objectives to support the mining industry. The aims of the SEPP are:

- To provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State
- To facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources
- To establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of mineral, petroleum and extractive material resources.

This SEPP provides conditional approval for types of related activities without requiring approval under the EP&A Act and guidance to consent authorities on relevant matters for consideration during the determination of a related application.

The proposed CPP reliability project works are not exempt, complying or prohibited development as defined by this SEPP. Clause 7(1)(d) of this SEPP identifies that developments in relation to "facilities for the processing or transportation of minerals" is permissible with consent. BHPBIC are seeking such consent via this Part 3A application.

Clause 12 of this SEPP details matters which the consent authority must consider prior to issuing a decision regarding an application under the EP&A Act. **Table 2.1** lists and considers these matters in relation to the proposed development.

Table 2.1 – Consideration of SEPP

Requirements of SEPP	BHPBIC Compliance
12(a)(i) - Consideration of existing and approved uses of land in the vicinity of the development.	The existing land use is approved for coal mining and ancillary services in accordance with CCL 724.
12(a)(ii) - Consideration of significant impact on uses that is likely to be the preferred use of land in the vicinity of the development.	The CPP works will benefit the existing land use by improving the reliability of coal processing.
12 (a)(iii) - Any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses.	The approved use of the land is for mining activities. The development is compatible with existing land uses.
12 (b) - Evaluate and compare the respective public benefits of the development and the land uses referred to above.	This is not applicable, as the land use will not alter due to the proposed development.
12 (c) - Evaluate any measures to avoid or minimise incompatibility between proposed activity and existing use.	The proposed development is to support the existing land use and there will be no incompatibility.

Clause 14 of this SEPP directs consent authorities to consider the following matters in relation to the protection of the environment prior to determining a development application under the EP&A Act:

- Impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable
- Impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable
- Greenhouse gas (GHG) emissions are minimised to the greatest extent practicable
- An assessment of greenhouse gas emissions.

The CPP reliability project will not have significant impacts on water resources as the existing water management systems at West Cliff Colliery can accommodate the small increase in surface water runoff and wastewater from coal processing. As detailed above there will be no impacts on threatened species or biodiversity due to the significant previous land disturbance.

The CPP does not have any direct (Scope 1) GHG emissions. Electricity powers the CPP and the production of this generates GHGs. This is an indirect (Scope 2) emission. The CPP is part of the overall coal supply chain that has downstream GHG emissions, such as the production of coke and during steel making (Scope 3 emission). A GHG assessment including calculations is included in **Section 5.7**.

Clause 15 directs that a consent authority must consider if the mining related application proposes efficient recovery of the mined resource. The proposed CPP reliability project will ensure the plant runs with improved efficiency as the new equipment will provide improved technology for recovery of the coal resource.

Clause 17 dictates a consent authority must have regard to a potential requirement for the rehabilitation of land following conclusion of mining related activities. BHPBIC will rehabilitate the land upon decommissioning.

BHPBIC believe this EA demonstrates the proposed development fully complies with relevant sections of SEPP (Mining, Petroleum and Extractive Industries) 2007.

2.4. REGIONAL ENVIRONMENTAL PLANS

2.4.1. Illawarra Regional Environment Plan No. 1

This document provides strategic planning controls and guidance for the Illawarra region as a whole in order to ensure Local Environmental Plans within the region remain consistent. West Cliff Colliery is located within Wollondilly Shire and thus, not actually in the Illawarra or the land area to which the Illawarra Regional Environmental Plan (REP) No. 1 applies. However, as activities related to the coal prepared by the plant occur in the Illawarra this section of the EA reviews relevant sections of this REP.

There are only two sections within this REP of relevance to the proposed CPP reliability project. The relevant sections in IREP 1 are:

- Provisions relating to extractive materials
- Provisions relating to coal.

IREP No.1 relates to major coal mining activities and does have policies relating to minor developments such as the proposed CPP reliability project. Notwithstanding this, the proposal meets relevant objectives relating to extractive materials and coal in Clauses 32 and 36 as the project will assist the CPP to remain fully integrated in the mining process due to the reduction in potential delays. This improves efficiency and assists BHPBIC to control environmental impacts.

2.4.2. Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment

This REP protects the catchment area of the Georges River that flows from near Appin to Botany Bay via the Western Sydney suburbs. The catchment map in **Figure 2** designates the area to which this REP applies.

Figure 2 – Greater Metropolitan REP No 2 Catchment Area

The general aims of this plan are:

- Maintain and improve water quality of the Georges River
- Protect and enhance the environmental quality of the catchment
- Ensure consistency of LEPs within the catchment to promote ecologically sustainable development
- Encourage effective communication between authorities regarding the catchment
- Assist to achieve water quality objectives in the Water Reform Package.

Clauses 8 and 9 of the REP detail general and specific policies that relate to different development proposals. **Table 2.2** details the general requirements applicable to this proposal and **Table 2.3** details the specific requirements applicable to this proposal.

Table 2.2 – General REP Policies & Compliance

Applicable REP General Policies	BHPBIC Compliance
8(a) - The aims, objectives and planning principles of this plan must be taken into account.	The proposed development is very minor and in accordance with the relevant aims, objectives and planning principles.
8(b) - The likely affect of the proposed development on adjacent or downstream local government areas.	There will be no impact on other local government areas as the proposal is only for works to the existing CPP.
8(c) - The cumulative impact of the proposed development on the Georges River or its tributaries.	The development is away from the river and catchments due to the location at the southern boundaries of the catchment. Upgrading the CPP will not add any new impacts.
8(d),(e),(f) - All relevant polices must be taken into account.	This EA details policies relevant to the proposal and provides assessments.
8(g) - Whether there are any feasible alternatives to the development.	BHPBIC have assessed different options to increase CPP reliability as discussed in **Section 1.3**. Improving the reliability of the existing CPP has the least environmental impact.

Table 2.3 – Specific REP Policies & Compliance

Applicable REP Specific Policies	BHPBIC Compliance
9(1) - Acid Sulphate Soils	The location for the CPP extension is not within an acid sulphate soil area.
9(5) - Land Degradation	BHPBIC will respond appropriately to minimise or prevent erosion, sedimentation and soil structure degradation. Due to the disturbed nature of the location for development, the proposal will not have a significant impact on native vegetation, habitats or sensitive natural environments. The existing West Cliff surface water management system prevents pollution of watercourses.
9(9), (12) - Stormwater Runoff & Water Quality	The proposed developments result in minimal additional runoff. The existing West Cliff surface water management system will continue to clean this runoff prior to discharge into a natural watercourse. Further assessment of stormwater runoff is in **Section 5.3**.

Clause 10 of this REP details consultation requirements. DoP, as the consent authority, will carry out public notification and consultation as required by Part 3A of the EP&A Act. This will comply with Clause 10 of this REP.

Clause 11 of this REP contains specific considerations in relation to differing types of development for consideration by the consent authority prior to the development being determined. Part 5 (Extractive Industry) relates specifically to the development proposed in this EA.

Part 5 advises that proposals for washing (or preparing) coal are permissible with consent if the proponent addressed the following matters:

1. The likely effect of the proposal on flood behaviour, geomorphology, vegetation, surface and groundwater quality, water quality, water quantity and hydrodynamics of any watercourse within the Catchment.

2. Whether a Rehabilitation Plan has been prepared in accordance with the Guidelines established by the Department of Land and Water Conservation in its Urban Erosion and Sediment Control Handbook (1992).
3. Whether the noise levels are generally in accordance with the guidelines in the Environmental Noise Control Manual (1994) prepared by the Environment Protection Authority.
4. Satisfaction that any proposed rehabilitation measures will be carried out in accordance with the guidelines in Managing Urban Stormwater Soils and Construction Handbook (1998) (The Blue Book) prepared by and available from Landcom and the Department of Housing.
5. The requirements of the Department of Land and Water Conservation and any relevant river management plan prepared by the Department of Land and Water Conservation or any water management plan approved by the Minister for Environment and the Minister for Land and Water Conservation.

The proposed reliability project works will not have any impact on the matters listed in bullet point 1 due to the location away from a creek and existing surface water management provisions at West Cliff Colliery. BHPBIC have an approved rehabilitation plan for the colliery that will cover the proposed works. The location of the CPP is well away from sensitive noise receivers. The works will not have any additional noise impacts. BHPBIC will carry out the construction works in accordance with the Managing Urban Stormwater Soils and Construction Handbook (1998). This EA is in accordance with any requirements from the Department of Land and Water Conservation.

2.5. ILLAWARRA REGIONAL STRATEGY

This 25-year blue print covers the administrative areas of Wollongong, Shellharbour and Kiama. It strongly focuses on job creation and sustainable settlements seeking to capture opportunities from the proposed $140 million expansion of Port Kembla.

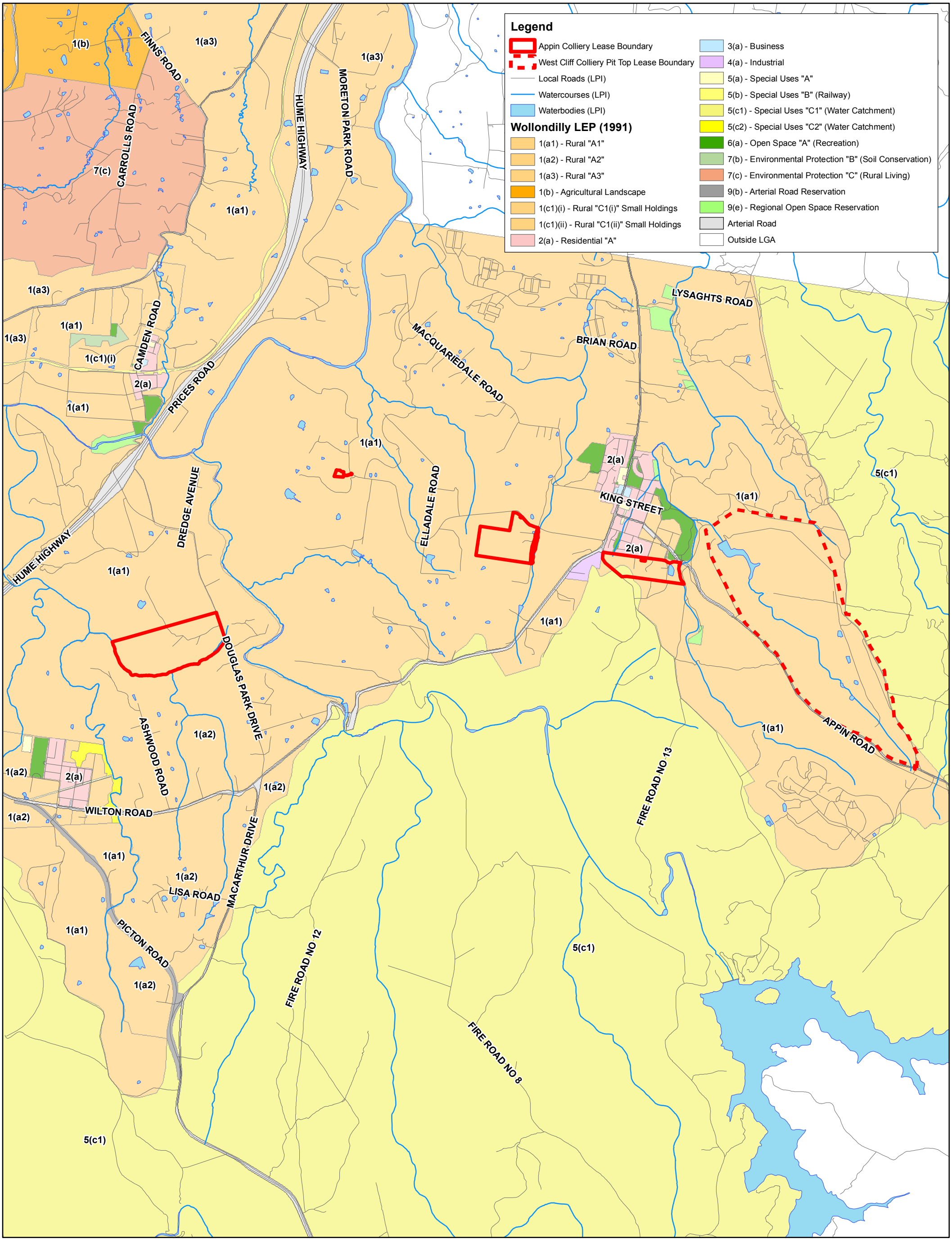
West Cliff Colliery is not on land covered by this policy, however the proposed works are assessed in accordance with this as activities related to this project occur in the Illawarra.

This Strategy is a strategic document and does not contain policies in relation to projects as small as this CPP reliability project. The development is generally in accordance with the Strategy as it serves to allow mining from West Cliff and Appin Collieries to continue efficiently which protects employment in the Illawarra and minimises environmental impacts.

2.6. LOCAL PLANNING CONTROLS

2.6.1. Wollondilly Local Environmental Plan 1991

West Cliff Colliery is zoned 1 (a1) (Rural A1 Zone) under the Wollondilly Local Environmental Plan 1991 (refer **Figure 3**). The primary objective of this rural zone is to protect land for agricultural uses, prevent inappropriate, premature and sporadic subdivisions that may prevent planned urban growth and protect the scenic quality and rural character. Mining works are permissible with DA consent within this zone.



bhpbilliton ILLAWARRA COAL

Scale 1:50,000 (at A3)

Metres
0 500 1,000 1,500 2,000 2,500

Land Zoning

BHPBIC WEST CLIFF AND APPIN COLLIERIES
FIGURE 3

N
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Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby
Date: 18 February 2009
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF: 109010-02_2803_Land_Zoning.mxd 01

As the proposed CPP project is required in relation to ensuring the reliability of the plant and the ongoing operation of West Cliff Colliery and as the proposal is such a minor development with no significant environmental harm the proposal is believed to be in accordance with Wollondilly LEP.

2.6.2. Wollondilly Draft Local Environmental Plan 2009

Wollondilly Shire Council's website advises the following:

> *"The amended Draft Wollondilly Local Environmental Plan 2009 was reported to Council in August this year [2008], where Council resolved to endorse the changes and resolved to place the amended draft plan on public exhibition once the Department of Planning enables Council to do so. Council is also in the process of preparing a new Draft Development Control Plan to accompany the Draft LEP.*
>
> *Council anticipates that the Draft LEP and Draft DCP will be placed on exhibition in late 2008, early 2009".* (Source: http://www.wollondilly.nsw.gov.au/planning/1328/12638.html)

Discussions with Council on the 16 December 2008 indicate there are no proposed changes to the rural zoning of the West Cliff Colliery lease area.

2.6.3. DCP 36 Development in Rural Areas

The purpose of this Development Control Plan (DCP) is to ensure that development carried out in rural zoned areas does not detract from rural amenity. To help achieve this, the plan provides controls and guidelines in relation to subdivision, agriculture, residential, non-residential developments, and services.

The DCP has controls relating to protection of the natural environment. It seeks to ensure development takes account of physical constraints of the land and to promote development in harmony, rather than in conflict, with the environment.

The proposed CPP reliability project is in accordance with this DCP as relevant erosion and sediment control measures will protect the environment during construction and operation of the facility. Due to the long-term disturbance of the development area there are no heritage items impacted by the proposed development.

3. CONSULTATION

This section describes the consultation undertaken for the EA and responses.

The minor scope of this development proposal results in significant consultation being unnecessary. This approach is further supported as there are no off site impacts directly attributable to the proposed development. Due to this there is little to discuss with various Government Agencies or the local community.

3.1. STATUTORY

BHPBIC has consulted with the DoP throughout the various stages of this Part 3A application. This has assisted in the preparation of the PEA and DGR's and directs the content of the EA. The EA will be sent to the following agencies for adequacy review prior to public exhibition:

- Department of Environment and Climate Change
- Department of Water and Energy
- Department of Primary Industries
- Sydney Catchment Authority
- Wollondilly Shire Council

3.2. COMMUNITY

BHPBIC makes the community aware of developments proposed at West Cliff Colliery via the Appin Area Community Working Group, refer to **Section 3.2.1** below. Additionally the PEA and DGR's are available on the DoP web site and this EA is available via the BHPBIC website.

3.2.1. Appin Area Community Working Group.

The BHPBIC website advises:

> *"The Appin Area Community Working Group (AACWG) is a community consultative forum working with Illawarra Coal.*
>
> *Established in 1998 (known then as the West Cliff Community Forum), the Group's purpose is to enable an ongoing, two-way flow of information between the community and Illawarra Coal. The AACWG's focus is to ensure the sustainability of the community around Illawarra Coal's operations. This includes environmental, social and economic sustainability.*
>
> *The Appin Area includes the towns and communities of Appin, Douglas Park, Wilton, Menangle and the southern parts of Campbelltown.*
>
> *The Group is regarded as important both by the community and Illawarra Coal to share information, achievements and concerns".*

BHPBIC has made the Appin Area Community aware of the proposed CPP reliability project at the meeting on the 18 November 2008 with a further update provided on the 17 February 2009. The proposal did not raise any queries or objections from the community group. BHPBIC also has information publically available at the BHPBIC Appin Community Office located at the Appin shops. The AACWG will remain informed by BHPBIC throughout the approval and construction process.

BHPBIC also operates a 24 hour, 7 days per week community telephone service for the community to contact BHPBIC to advise of concerns, discuss BHPBIC operations and request information. Information on the CPP reliability project is available via this service, it can be contacted on 1800 102 210.

This community consultation has not resulted in any objections to, or concerns regarding, the proposed CPP works.

4. EXISTING & PROPOSED DEVELOPMENT

This section describes the existing development associated with this application and the proposed development.

4.1. EXISTING ENVIRONMENT

The pit top area contains a mine drift, administration buildings, workshops, the CPP, a coal wash emplacement and various water management ponds. Access to the pit top is along Wedderburn Road, which was built to serve the Colliery, and existing fire trails. Urban developments do not influence the pit top environment due to the separation from public areas and residential developments.

The West Cliff Colliery pit top lease area topography is undulating and includes two valleys. Mature native vegetation communities cover the majority of this area, generally consisting of remnant Sandstone Ridgetop Woodland, Exposed Sandstone Scribbly Gum Woodland and Sandstone Gully Peppermint Forest. The western boundary of the Dharawal State Conservation Area follows Wedderburn Road and extends further north than the pit top.

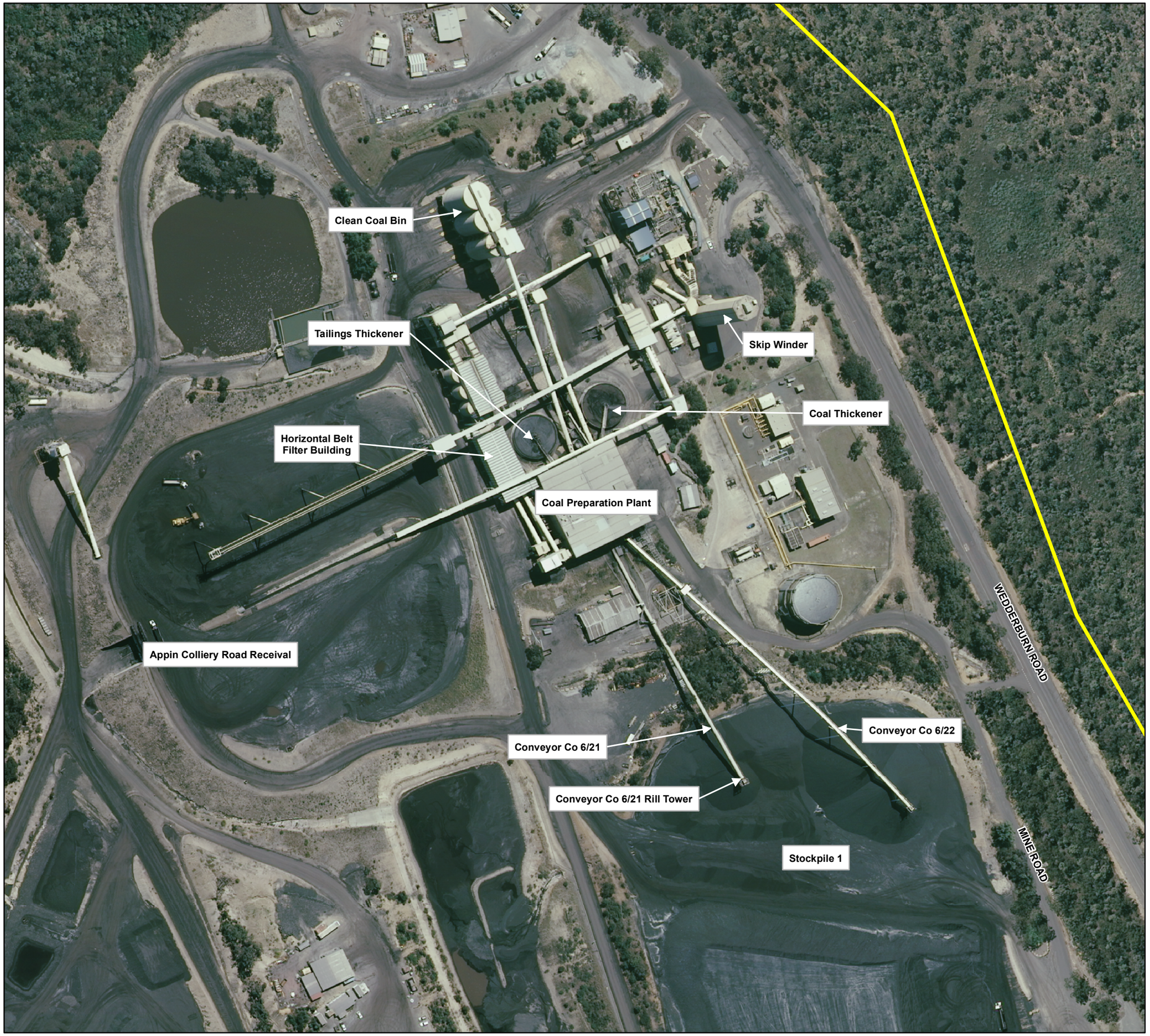
Land use around the West Cliff Colliery lease area generally consists of:

- North – mature bushland in the Dharawal State Conservation Area
- East - mature bushland in the Dharawal State Conservation Area
- South – Appin Road and mature bushland
- West – Appin Road, mature bushland and Appin township.

The coal wash emplacement area is to the southwest of the CPP and is gradually moving north. Progressive revegetation of the Stage 1 & 2 emplacement area is occurring. This creates a vegetated rise that provides additional screening of the pit top and CPP from Appin Road.

The West Cliff CPP is located towards the north end of the West Cliff Colliery surface facilities. **Figure 4** identifies the locations and shows that the CPP sits amongst numerous other buildings, roads, coal stockpiles and other development that are ancillary to the mining activities. The pit top area is a busy working environment that includes heavy machinery, large equipment (such as front-end loaders), large trucks (such as B-doubles), conveyor belts and smaller vehicles.

All of these activities and equipment influence the existing environment in proximity to the CPP. It is industrial in nature, with the landform, topography and layout designed to allow coal processing and stockpiling activities to progress as efficiently as possible. There are up to eight small scrub bushes that require removal to allow the proposed southern extension to take place. It is likely BHPBIC planted these as part of the pit top landscaping, as they are not remnant vegetation and have little ecological value.



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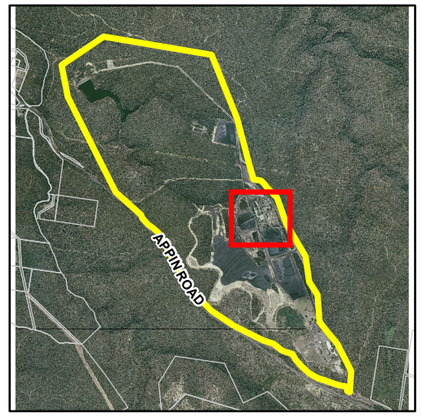
ILLAWARRA COAL

Site Plan

BHPBIC WEST CLIFF COLLIERY
COAL PREPARATION PLANT

Legend

- West Cliff Colliery Pit Top Lease Boundary
- Cadastre (LPI)



N
W E
S

FIGURE 4

Scale 1:2,000 (at A3)

Metres
0 25 50 75 100

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 03 March 2009
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109010-02_2802_SitePlan.mxd 03

4.2. EXISTING COAL PREPARATION PLANT

A CPP is a facility that processes ROM coal to separate out rock and mineral contaminants to produce clean coal. Traditional specific gravity separation techniques are used in the CPP. Clean coking coal from the West Cliff CPP is primarily used in steel manufacturing. The proposed project is to improve the reliability of the CPP, thus ensuring the efficient processing of current output from the Appin and West Cliff Collieries without the need for excessive handling or stockpiling.

Coal at West Cliff CPP is received from West Cliff Colliery by a vertical skip winder and via trucks from Appin Colliery. The skip winder (refer to **Figure 4**) lifts West Cliff Colliery coal from underground to the surface. This coal then travels via conveyor into the CPP. The Appin coal trucks tip coal into an under road hopper at the road receival area (refer to **Figure 4**) and it travels via conveyor into the CPP. ROM coal consists of coal, rock and other mineral contaminants extracted from the coal seam. ROM coal can have large variability of moisture and maximum particle size.

ROM coal from the two collieries can be fed directly into the CPP or stored on stockpiles near the CPP prior to processing. This allows the CPP to operate at a consistent throughput. It is not preferable to stockpile coal prior to processing as this adds another step into the coal handling process that increases time (i.e. machinery to stack and reclaim the coal) and causes breakage of the ROM coal generating a finer material that uses additional resources to process and increases GHG emissions. The proposed improvement of the CPP will allow it to operate with greater reliability, thus reducing the need for ROM coal stockpiling.

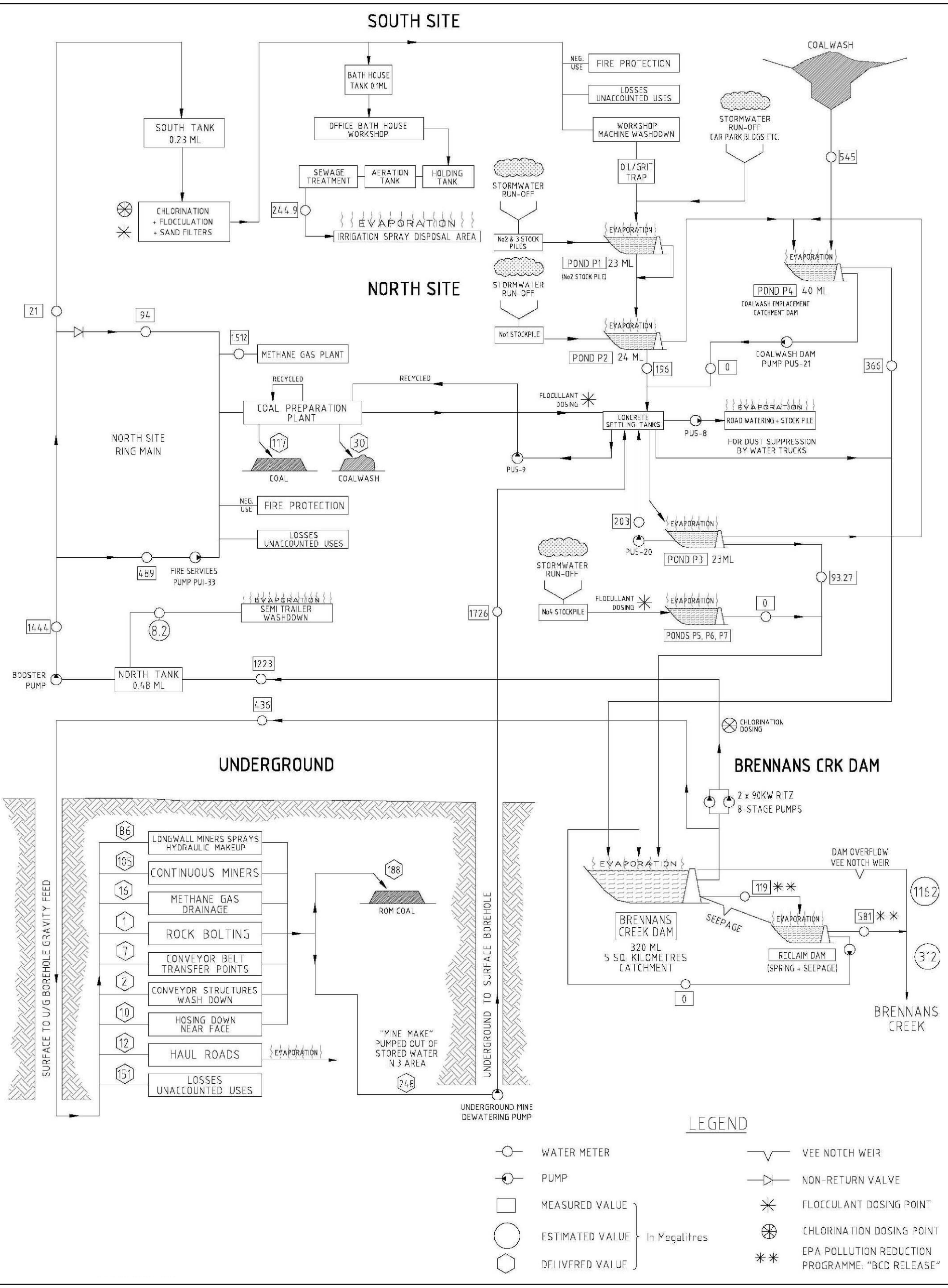
The existing West Cliff CPP uses water captured and recycled from within the West Cliff Mining Purposes Lease in accordance with the Water Act License No. 10SL038404 issued by the Department of Water and Energy. No potable or external sources of water are used in the West Cliff CPP or other surface or underground activities.

The primary water storage at West Cliff is the 320 ML Brennan's Creek Dam (BCD). This captures surface runoff from within the Mining Purposes Lease area, and also mine water pumped from underground. Several other pollution control ponds and settlement tanks play an integral role in on-site water management (refer to **Section 7.3.3** for a description). A diagrammatic representation of the water management system for the West Cliff surface facilities (including the CPP) and West Cliff Mine is shown in **Figure 5**.

During 2007/2008, 583 ML of water sourced from BCD was utilised for washing coal, 147 ML was lost from the system in coal moisture and coal wash, and 436 ML was returned to BCD for later reuse or discharge to Brennan's Creek. Following implementation of this Reliability Project similar volumes of water are likely to be utilised for coal washing. However, lower volumes of water should be lost from the system due to the more efficient Horizontal Band Filters that result in dryer product coal and a higher volume of water returned to BCD for recycling or discharge.

The majority of the CPP equipment is within a large warehouse style building constructed of corrugated steel sheeting attached to a steel framework. There are numerous conveyor belts leading into and out of the CPP, which feed in ROM coal or stack out clean coal. The land rises in height directly to the south of the CPP. A vehicular access is constructed from the top of the rise into the second level of the CPP (refer to **Figure 6**).

The CPP operates with limited intervention from a small number of CPP operators. However, employees also perform maintenance, planning, health, safety, environment, community and engineering functions in order to ensure reliable operation of the CPP.



WEST CLIFF MINE - AEMR 2007/2008

DIAGRAMMATIC WATER MANAGMENT SYSTEM

FIGURE 5

Map Produced by Cardno Forbes Rigby
Date: 11 May 2009
GIS MAP REF:
109010-02_2807_WaterManagementSys.mxd 01

Source: BHP Billiton Illawarra Coal

Figure 6 – West Cliff CPP & Parking Area

The West Cliff CPP is a process that operates in the steps described below.

Step 1. Crushing

The ROM coal travels to the CPP via a conveyor and passes through a rotary breaker that reduces the top size of the coal making it easier to handle.

Step 2. Screening

The ROM coal passes through a screen house that sizes the coal into two groups. The coarser coal travels to one set of storage bins and the finer coal to another set of storage bins prior to entering the CPP. The sizing process prepares the ROM coal for treatment within the CPP via different processes.

Step 3. Separation

Separation occurs in three different ways. These are described below.

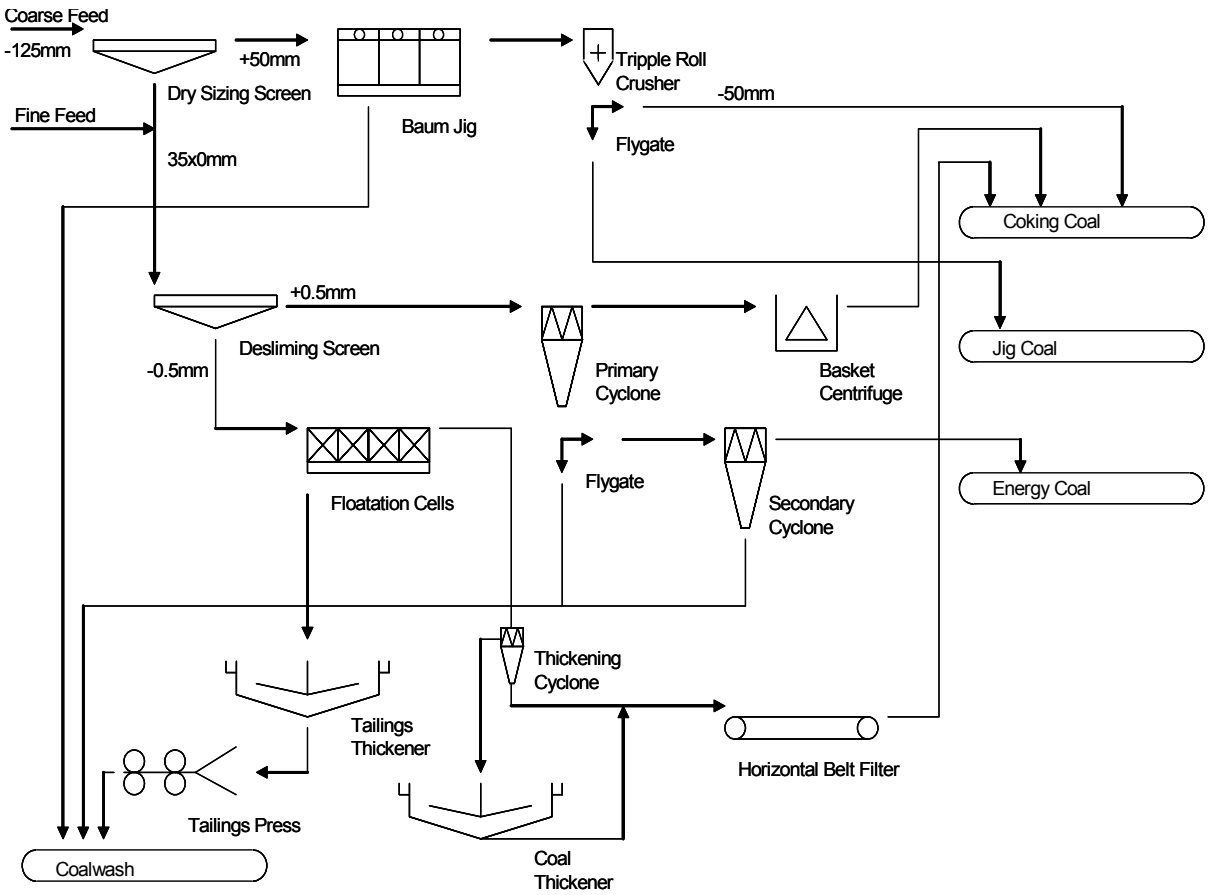
Coarse Coal Circuit – a Baum Jig treats the coarse material by separating coal from rock via density difference. The coal travels to the clean coal storage bins and the rock and other contaminants are sent to the Refuse bin.

Small Coal Circuit – screening of the small coal occurs again and the coarser material is combined with magnetite slurry of controlled density and pumped under pressure into dense medium cyclones to separate the coal from rock. Centrifuges dewater the coal prior to

storage in the clean coal bins. Refuse bins store the waste rock prior to emplacement. The CPP reuses water removed from the coal and the magnetite slurry. Processing of the fine coal material occurs in the fine coal circuit.

Fine Coal Circuit – The fine coal is mixed with water and treated in flotation cells where air is bubbled through the coal / water slurry, the fine coal particles stick to the air bubbles and is retrieved from the top of the flotation cells. The waste rock material sinks to the bottom of the flotation cell allowing collection. Thickeners are added to both the fine clean coal and tailings materials before passing through filters to remove as much water as possible. The CPP reuses the reclaimed water. The dewatered fine coal travels to the clean coal storage bins and the dewatered tailings to the refuse bin.

Figure 7 visually demonstrates the steps described above.



(Source: BHP Billiton Illawarra Coal Pty Ltd)

Figure 7 – West Cliff CPP Operational Flowchart

4.3. PROPOSED RELIABILITY PROJECT

The greatest limitations on reliability of the CPP are the coarse coal (Jig) circuit and the flotation circuit. BHPBIC propose to replace both of these circuits with current technology. The installation of these two new circuits requires two items of ancillary support equipment. The proposed development also requires relocation of the maintenance building and removes the requirement for conveyor Co 6/21 and the associated Rill Tower. Therefore, the proposed project has two main components and four subsidiary portions (detail below).

Figure 9 provides drawings of all the new developments associated with the reliability project. The drawings in **Appendix B** provide further detail on the Coarse Coal Circuit and Flotation Circuit buildings.

4.3.1. Coarse Coal Circuit

The first component of the proposal comprises the construction of a replacement coarse coal circuit. The proposal is to locate this to the south of the existing CPP and slightly to the west of the existing eastern wall (refer to **Figure 8**).

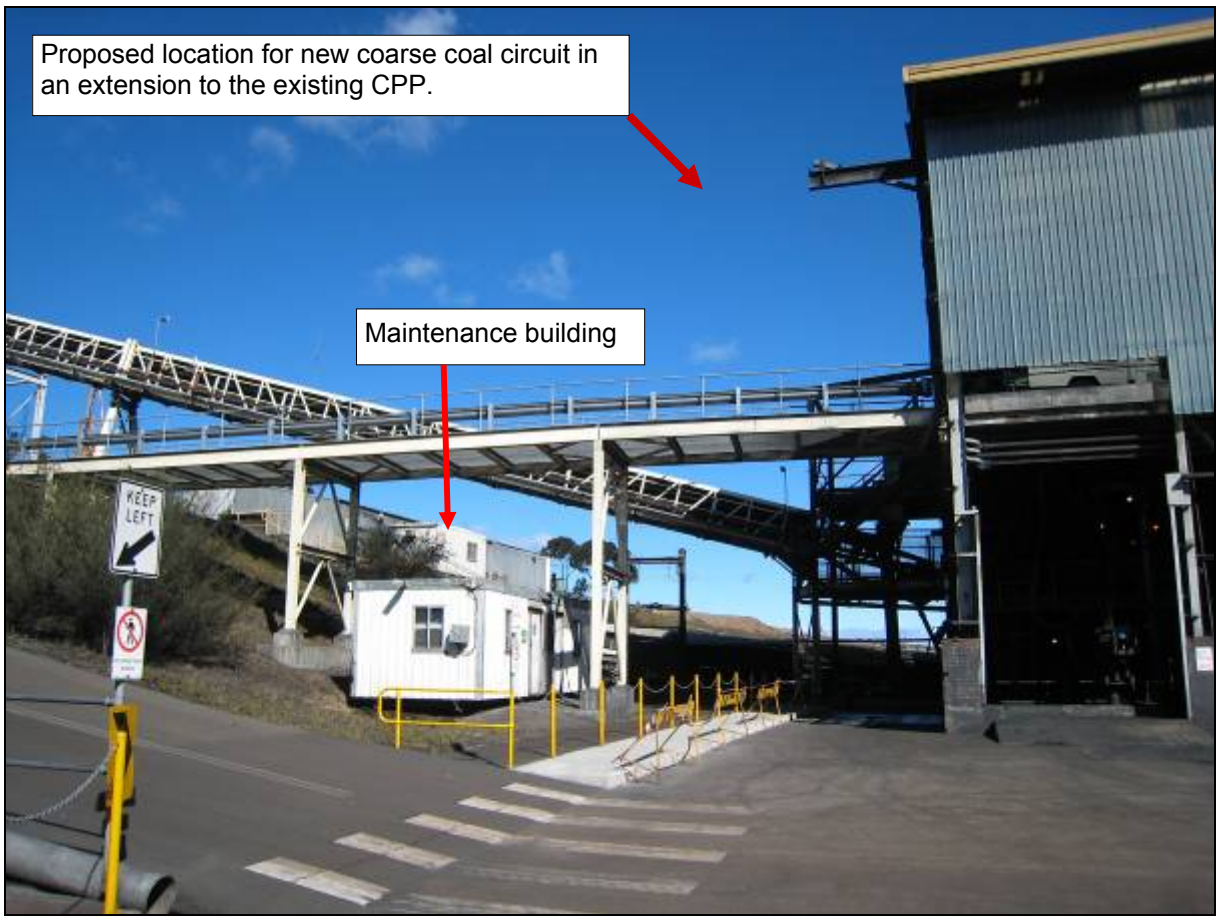
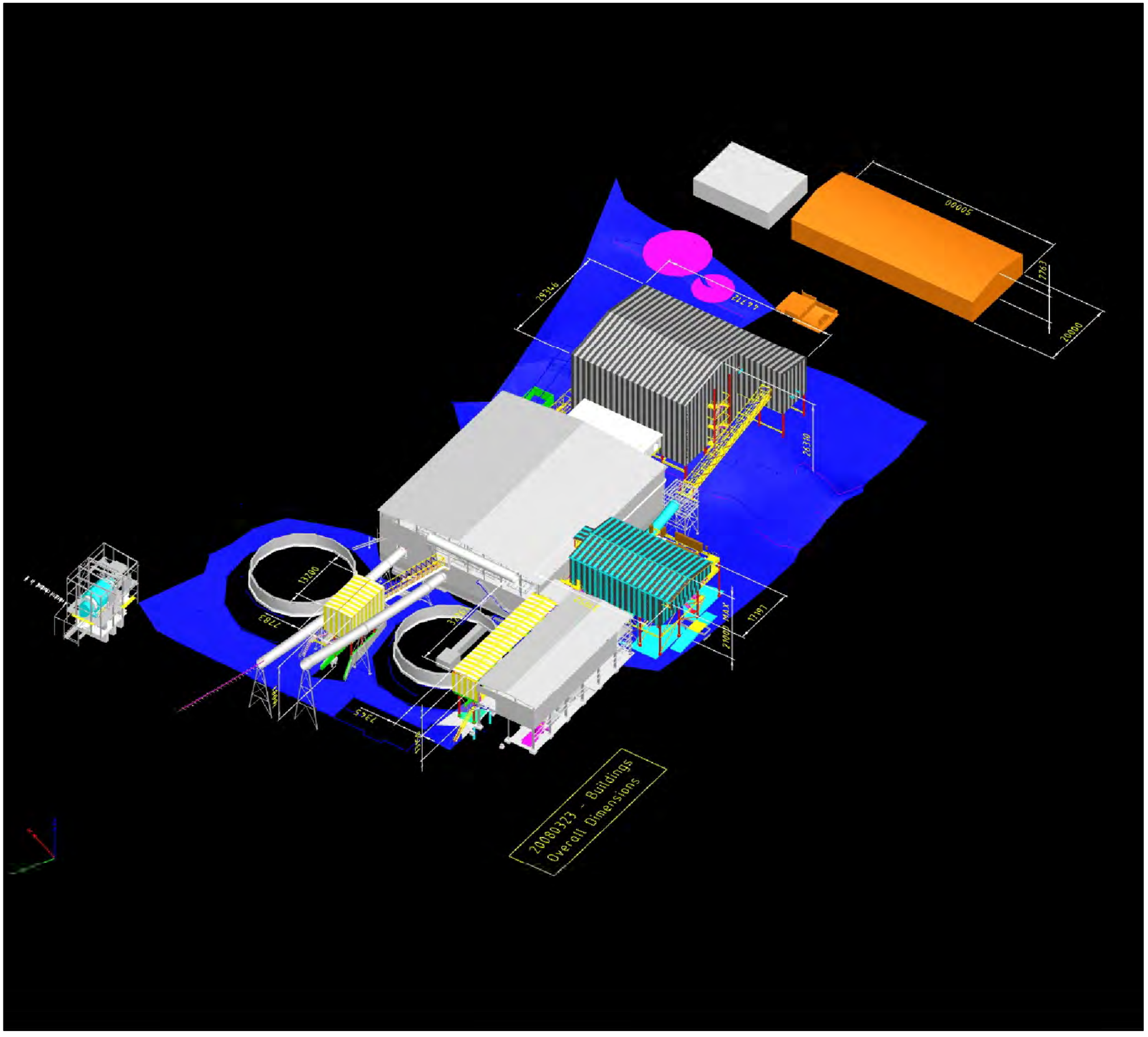


Figure 8 – Proposed Location for New Coarse Coal Circuit

The new circuit will be housed in a rectangular extension to the CPP building that is approximately 26.3m high, 44m long and 28m wide. It will be constructed of similar materials to the existing CPP.



bhpbilliton
ILLAWARRA COAL

Connell HATCH
Infrastructure for Industry

Proposed Developments

BHPBIC WEST CLIFF COLLIERY
COAL PREPARATION PLANT

Legend

- Proposed Floatation Circuit
- Proposed Coarse Coal Circuit
- Proposed Utility Building
- Existing Buildings
- Proposed Horizontal Belt Filter and Band Press Filter Buildings

FIGURE 9

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 11 May 2009
GIS MAP REF:
109010-02_2805_ProposedDevelopments.mxd 02

Proposed Development Layout from Connell Hatch - used with permission

4.3.2. Flotation Circuit

The second component of the proposed project is a replacement flotation circuit which is to be located on the western side of the CPP (refer to **Figure 10**).

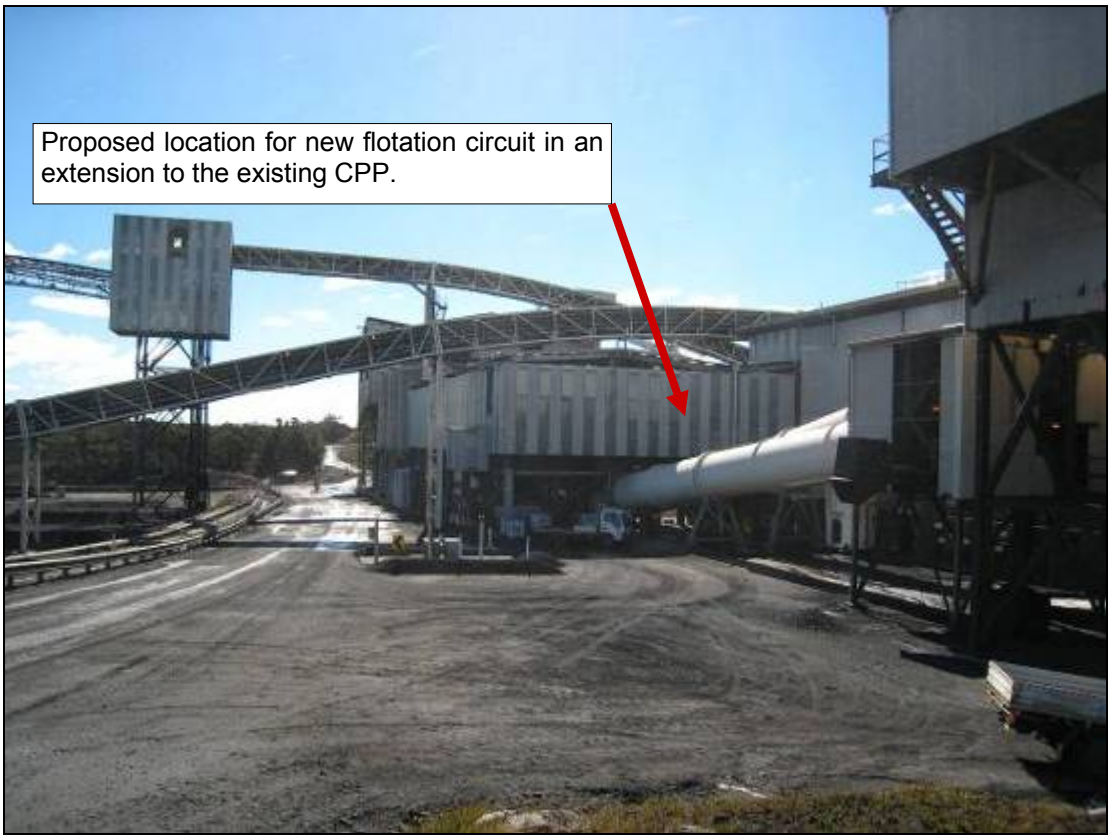


Figure 10 – Proposed Location for New Flotation Circuit

This will form an extension to the existing CPP building. The extension will be approximately 18.3m high, 24m long and 15m wide.

The proposed new coarse coal circuit and flotation circuit will allow greater reliability of the CPP by replacing old technology which is reaching the end of its serviceable life, with current technology that has greater reliability. This will in turn allow the CPP to reliably meet the output of the two collieries.

The design drawings show the size and scale of the extensions in comparison to the existing West Cliff CPP. This demonstrates they are comparable to the existing CPP. The location of the extensions demonstrates the proposed equipment will be located adjacent to and within the existing CPP. This retains development within disturbed areas and locations that are within the West Cliff Colliery pit top areas of environmental management.

4.3.3. Band Press Filter

The Band Press Filter (BPF) works in association with the coarse coal circuit. This circuit separates waste material such as rock and other contaminants from the clean coal. The

BPF takes waste materials from the coarse coal circuit and process this waste to remove water allowing greater reuse in the CPP operation and improved management of Coal Wash.

BHPBIC propose to add one new BPF. This will support the proposed coarse coal circuit to ensure reliability of the full coarse coal process.

The new BPF will be located in an elevated position above the storage area and between the Tailings Thickener and the Coal Thickener cells shown in **Figure 4**. The dimensions of the building that will house the BPF are 7.8m x 13.2m x 16.1m (h). **Figure 11** is a photograph of the proposed location of the BPF.

Figure 11 – Location for Proposed Band Press Filter

4.3.4. Horizontal Belt Filter

The Horizontal Belt Filter (HBF) is ancillary to the proposed flotation circuit, which forms part of the fine coal circuit. The CPP already has two older HBF, which dewater the coal fines captured by the flotation circuit to increase water reuse in the CPP.

BHPBIC propose to add a single HBF to the CPP to increase the reliability of the process. This will be located adjacent to the two existing HBFs and under an extension to the roof of the Horizontal Belt Filter building (shown in **Figure 4**). The proposed building to house the HBF will form an extension to the existing HBF building measuring 7.3m x 32.3m x 13.2m (h).

Figure 12 is a photograph of the existing HBF and shows the location for the new HBF.

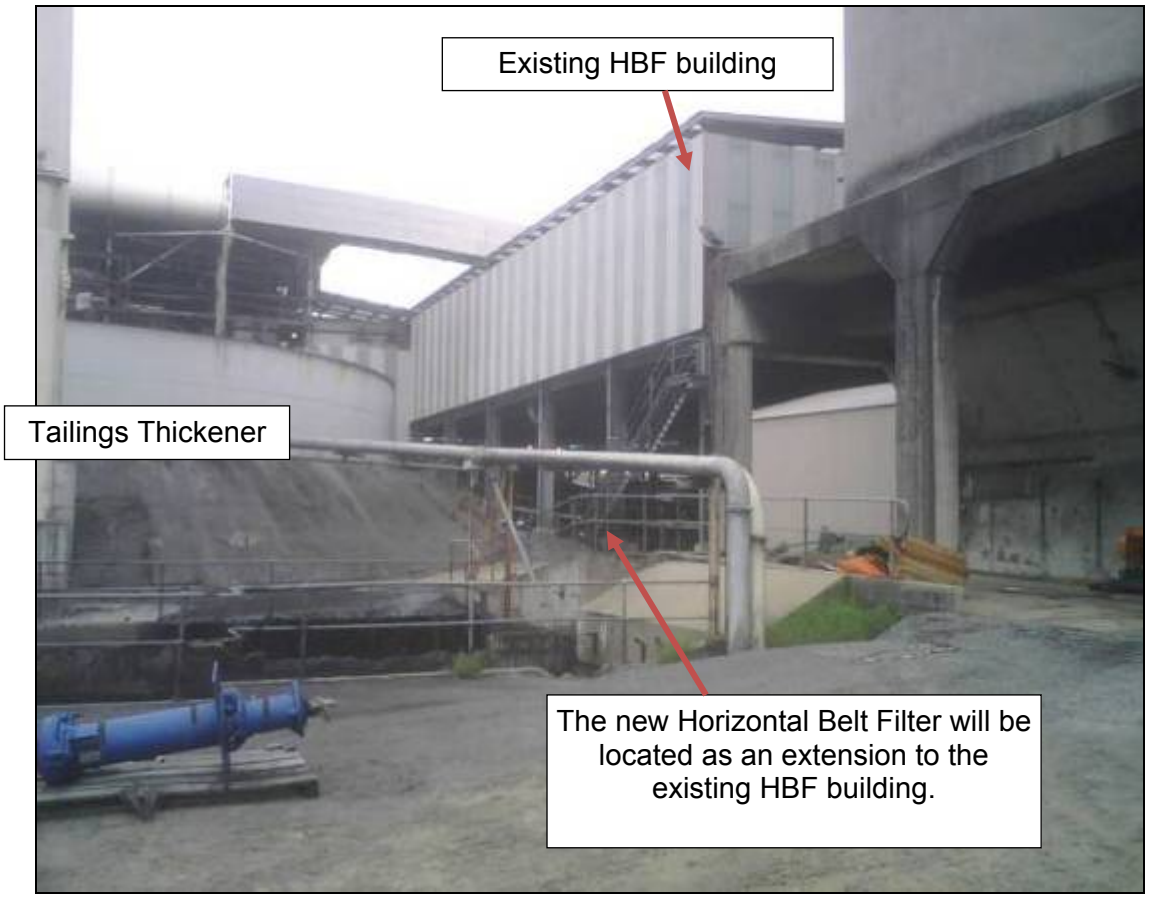


Figure 12 – Proposed Location for New Horizontal Belt Filter

4.3.5. Maintenance Building

The West Cliff Colliery maintenance building is located slightly to the south of the CPP. This building is a workshop and storage facility that is ancillary to CPP operations. The workshop is a steel frame construction with sheet steel sides and a pitched roof. The dimensions of the building are 30m long by 15m wide by 7m high. **Figure 13** shows the existing maintenance building.

The width of the proposed southern CPP extension (to house the proposed coarse coal circuit) requires land on which the maintenance building sits. To allow the CPP extension BHPBIC propose to remove the maintenance building and implement a replacement in the cleared area to the south of the existing maintenance building. **Figure 14** shows the proposed location of the replacement maintenance building.

Figure 13 – Existing Maintenance Building

Figure 14 – Proposed Location for new Maintenance Building

The new location moves the maintenance building closer to a stand of trees. However, the building fits into the existing cleared area and there are no tree works or removal required.

The new maintenance building will be 50m long by 20m wide by 7m high. This is larger than the existing maintenance building to allow this facility to more effectively meet the requirements of colliery operations. It is appropriate to enlarge the maintenance building at this time as the work will form part of the overall CPP works using the same labour force, suppliers and construction mitigation measures.

The new maintenance building will be a simple steel frame with sheet steel sides and a pitched roof. The will be the same material as the proposed CPP extensions resulting in a similar appearance. As the building is a lightweight construction deep excavation for foundations are unnecessary. Thus, impacts from development will be minimal.

4.3.6. Conveyor Co 6/21

Figure 4 identifies this conveyor and the associated rill tower. The conveyor transports clean coal from the CPP to the rill tower. The rill tower deposits clean coal to Stockpile 1 prior to loading onto trucks for delivery to the port of Port Kembla. The alterations to the CPP operation resulting from the new equipment proposed by the reliability project will make conveyor Co 6/21 and the rill tower redundant.

At present, this conveyor only moves small quantities of coal as the western area of Stockpile 1 does not receive much coal or accommodate much activity. BHPBIC propose to use conveyor Co 6/22 to move all clean coal allocated to Stockpile 1. Deposit of all coal for Stockpile 1 will be in the eastern area to intensify activities in a single location.

Figures 15 & 16 show both conveyors and the rill tower.

BHPBIC propose to dismantle this conveyor and remove the materials from site. This work will utilise a crane to support the conveyor sections whilst contractors use work platforms to access the joints of the conveyor support structure. The entirety of conveyor Co 6/21 is accessible to demolition equipment without having to access any vegetated areas. This ensures that these activities will not have any impact on flora or fauna.

Figure 15 – Conveyor Co 6/21

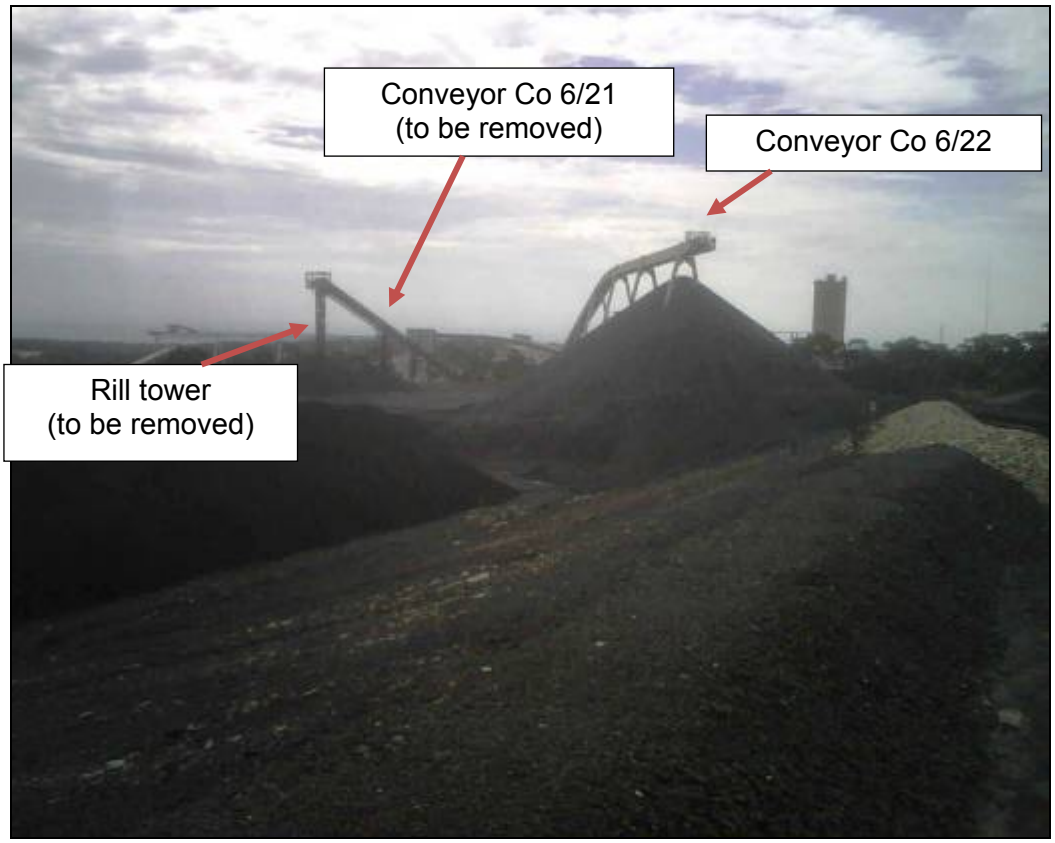


Figure 16 – Conveyors Co 6/22 & Co 6/21

5. PROJECT JUSTIFICATION

This section justifies the proposed development.

5.1. NEED FOR THE PROJECT

The implementation of the reliability project for the CPP is justified for the following reasons:

1. The CPP will be able to reliably process existing output from Appin & West Cliff Collieries
2. It will allow BHPBIC to meet customer demand for coal, which is primarily metallurgical coal, from the West Cliff and Appin Collieries in a timely and efficient manner
3. The existing CPP is located within a significantly disturbed area. Further development in this area is preferable to the implementation of a new CPP elsewhere, as this would cause further disturbance
4. The new technology will extend the operational lifespan of the CPP
5. The project has sound financial justification, as the new equipment will replace existing machinery that has a higher potential for failure resulting in lost processing time.

5.2. ALTERNATIVES CONSIDERED

BHPBIC reviewed four options in relation to increasing processing throughput capability. A description of these is below.

5.2.1. Option 1: Improve the reliability of the existing West Cliff CPP

This is the selected option. This EA provides full details and an impact assessment on this proposal.

5.2.2. Option 2: Implement a new CPP at West Cliff Colliery

This option involves the construction of a stand-alone CPP to complement the existing CPP. It would be approximately half the size of the existing CPP and provide the reliability to meet the output of West Cliff and Appin Collieries.

The construction of a stand-alone CPP would enable coal processing to continue whilst the existing CPP is shut down for maintenance or repairs. This would improve the coal processing system by allowing increased reliability for processing of coal.

This option was not selected as:

- There will be significantly less environmental impact by improving the reliability of the existing CPP as a much smaller area of land will be disturbed
- The construction of a new CPP incorporates aspects that duplicate parts of the existing CPP. This work would result in significant expense in the establishment of infrastructure that would not be required in Option 1.

5.2.3. Option 3: Improve Reliability of Dendrobium CPP

BHPBIC own Dendrobium CPP, this primarily processes coal from BHPBIC's Dendrobium mine. This is located within the BlueScope Steel industrial precinct on land owned by BlueScope Steel and surrounded by heavy industrial developments. Upgrading of the Dendrobium CPP is not a viable option to provide the additional required capacity because:

- It is already operating near capacity and there is no physical space for expansion.
- The proposal would result in additional truck movements on public roads through the transport of unprocessed Run of Mine (ROM) coal to the Dendrobium CPP and additional transportation of Coal Wash to West Cliff Emplacement area.

5.2.4. Option 4: Take No Action

Section 5.3 discusses the consequences of not proceeding.

5.3. CONSEQUENCES OF NOT PROCEEDING

The non-implementation of reliability improvements would result in BHPBIC's customers demand for coal being less likely to be met, as ROM coal would not always be able to be processed to meet requirements.

Not improving the reliability of the CPP will also detrimentally impact on mining operations at Appin and West Cliff Collieries, by bottlenecking the coal supply chain. If the coal cannot be processed at a similar rate as the mines output, it will have to be stored on stockpiles. This introduces inefficiencies into the system.

The installation of modern ROM coal processing equipment will also deliver environmental benefits in terms of more efficient consumption of power from the CPP as a whole, due to less electricity loss due to sub-optimal performance and less electricity use in relation to equipment maintenance and repair. The project also improves water efficiency as the new equipment extracts a greater amount of water from the coal wash for re-use or release.

6. ENVIRONMENTAL RISK ASSESSMENT

This section identifies environmental risks associated with the proposed development.

6.1. INTRODUCTION

The identification of environmental risks/impacts is based on an appreciation of the site location and an understanding of the CPP reliability proposals. This EA provides information on the site location and a description to allow understanding of the project. This environmental risk assessment provides direction and context for the identification of environmental impacts from the reliability project, the probable level of severity and likelihood for mitigation measures.

This environmental risk assessment is based on an index formed from the perceived likelihood of an occurrence, and the subsequent consequence of that occurrence using the process outlined in the Australian Standard *AS/NZS 4360:2004 Risk Management*.

Both likelihood and consequence are measured on a scale of 1 – 5 (with 1 corresponding to improbable/negligible and 5 corresponding to frequent/catastrophic). A subsequent index was developed and all identified risks classified as belonging to either 'Low', 'Moderate' or 'High' risk categories (**Table 6.1**). This is a conservative index, emphasising the number of Moderate and High risks identified.

Table 6.1- Environmental Risk Assessment Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Improbable	Low	Low	Low	Moderate	Moderate
Remote	Low	Low	Low	Moderate	High
Occasional	Low	Moderate	Moderate	High	High
Probable	Moderate	Moderate	Moderate	High	High
Frequent	Moderate	High	High	High	High

6.2. RISK CATEGORIES

Table 6.2 considers and assesses the following environmental risks:

- Soil & Water Quality
- Air Quality
- Noise
- Waste
- GHG & Energy Use
- Ecology
- Aboriginal & European Heritage
- Visual
- Contamination

Table 6.2 - Preliminary Environmental Risk Assessment

Environmental Impact	Process/Activity	Potential Impacts from Proposed Development	Risk
Soil & Water Quality	Sediment escape during construction of the proposed development. Increased surface water runoff due to the replacement of soil with building roofs.	Movement of sediment into natural watercourses increasing silt levels and reducing water quality causing detrimental impact to aquatic flora & fauna. Surface water run off is too great for the existing water management systems to accommodate resulting in untreated water entering the natural watercourses.	**LOW** Refer to **Section 7.3**
Air Quality	Generation and escape of dust during construction of the proposed development. Dust generation from the operation of the new CPP equipment.	Increased dust deposits at the pit top that could be transported off site on vehicles or personnel.	**LOW** Refer to **Section 7.4**
Noise	Increased noise generation during construction and/or operation of the proposed developments.	Disturbance at sensitive noise receivers.	**LOW** Refer to **Section 7.5**
Waste	Generation of additional waste from construction activities. Generation of waste from new CPP equipment.	Additional waste not being allocated correctly to allow recycling resulting in increased landfill deposits. Waste from the new CPP equipment must be disposed of in accordance with protocols to minimise environmental impacts.	**LOW** Refer to **Section 7.6**
GHG & Energy Use	Emissions from construction & demolition activities. Emissions associated with use of the new CPP equipment.	GHG emissions can have various environmental impacts; the minimisation of these provides increased protection against the impacts of climate change.	**LOW** Refer to **Section 7.7**
Ecology	The removal of ten *Leptospermum sp (continentale)* to allow the southern CPP extension.	Reduction in vegetation adjacent to the CPP.	**LOW** Refer to **Section 8.1**
Aboriginal & European Heritage	Construction of proposed developments.	Damage to heritage items.	**LOW** Refer to **Section 8.2**
Visual	Visibility of construction equipment such as cranes. Visibility of the CPP extension.	Reduction in visual amenity from residential properties.	**LOW** Refer to **Section 8.3**
Contamination	Disturbance of contaminated land from construction of CPP extensions.	Release of possible contamination contained in the soil and escape in to other undisturbed areas or watercourses.	**LOW** Refer to **Section 8.4**
Utilities	Requirement for additional utility infrastructure to service the new CPP equipment.	Land disturbance or vegetation removal to allow access for new utility services.	**LOW** Refer to **Section 8.5**
Cumulative Impacts	Similar environmental impacts arising from different activities at the West Cliff pit top.	Increased harm on the environment that is not successfully mitigated by measures proposed for the individual activities.	**LOW** Refer to **Section 8.6**

7. KEY ENVIRONMENTAL IMPACTS

This section identifies and assesses key environmental impacts.

7.1. OVERVIEW OF ENVIRONMENTAL IMPACTS

The environmental assessment of the proposed CPP reliability project is divided over two sections of this report. **Section 7** reviews key environmental issues as identified by the DGR's. **Section 8** reviews secondary environmental issues that BHPBIC consider important for a full assessment of the project. **Table 7.1** identifies the environmental issues under assessment in each section of this EA.

Table 7.1 – Overview of Environmental Impacts

Key Environmental Impacts	Secondary Environmental Impacts
Soil & Water Quality	Ecology
Air Quality	Aboriginal & European Heritage
Noise	Visual
Waste	Contamination
Greenhouse Gas & Energy Use	Utilities

7.2. ENVIRONMENTAL PROTECTION LICENCE

West Cliff Colliery operates in accordance with Environmental Protection Licence (EPL) 2504 as administered by the Department of Environment and Climate Change. This document is provided in **Appendix C**. This EPL relates to the following areas of discharges or emissions and sets appropriate limits in relation to their type and magnitude:

- Water quality – amount of oil, grease, biochemical oxygen demand and suspended soils and pH level
- Dust – the EPL does not set emission limits but stipulates, "the premises must be maintained in a condition which minimises or prevents the emission of dust from the premises".
- Noise – the EPL does not specify noise emissions limits
- Waste – the EPL does not specify waste emissions limits
- GHG emissions – this is not included in the EPL.

BHPBIC expect the proposed CPP Reliability Project will not require any variation to EPL 2504.

7.3. SOIL & WATER QUALITY

7.3.1. Potential Impact

The construction of the CPP extensions will involve some earthworks, which must be managed to ensure soil erosion and sediment escape from the works areas is minimised.

Once constructed the CPP reliability project will replace approximately ten *Leptospermum sp (continentale)* shrubs and existing soil surface with a roofed building. The new maintenance building has a larger roof area than the existing maintenance building; which will result in a minor increase to the impervious area. The surface area of the new roofs result in a small increase in stormwater discharge compared to the current environment.

The CPP generates wastewater during normal operation that is treated on site. The equipment proposed by this reliability project will also produce wastewater, which will require treatment.

7.3.2. Construction Mitigation Measures

The contractor responsible for demolition and construction will ensure the works do not result in erosion or sediment escape into natural watercourses.

The demolition and construction contractor will meet this requirement by conducting all works in accordance with the 'Blue Book' (Soils and Construction, Volume 1, 4th edition March 2004, Landcom). An Erosion and Sediment Control Plan will guide the demolition and construction works and is anticipated to include the following types of controls:

- Regular site drainage
- Identification of drainage channels and effective management of surface water during construction works
- Reducing the amount and velocity of any water flows over the construction site
- Direction of surface water to existing ponds
- Removal of suspended sediment in existing ponds at West Cliff Colliery pit top
- Sediment filters or fences.

Opportunities for environmental impacts from erosion or sediment escape due to this project are further reduced due to the minor nature of the development (compared to other pit top activities) and the location within the West Cliff Colliery surface water management system (WMS) (description in **Section 7.3.3**).

In the event that any sediment escapes the works area for this project, it will be captured by the WMS before being able to access any natural watercourse. Treatment in the water management system will remove high concentrations of sediment via settlement to minimise the chances for any environmental impacts.

7.3.3. Stormwater Mitigation Measures

There is very low potential for the increase in stormwater runoff due to the new roof areas to have any environmental impacts. This is because the existing WMS has the capacity to capture and treat the additional runoff prior to accessing a natural watercourse. The reminder of this section explains the water management system and uses calculations to prove the adequacy to accommodate increased runoff.

Current Drainage Upgrade Works

BHPBIC engaged Cardno to prepare a surface water hydrologic study based on existing and proposed operations at West Cliff Colliery pit top as part of the Stage 3 coal wash emplacement expansion approval in 2007. The final report (July 2007) made recommendations for various infrastructure upgrades and consequently the surface water infrastructure at WCC is in the process of a multi-million dollar upgrade.

The proposed water infrastructure comprises of two new emplacement valley dams to treat dirty water runoff (totalling approximately 70 ML), a new large (45 ML) treatment pond (called Pond P4A) for pit-top water management, retrofitting of existing drainage infrastructure, the extension of clean and dirty water conveyance channels, and chemical-dosing facilities to enhance the sediment removal capabilities of site ponds.

These works are underway and expected to continue in a staged approach until 2025. Construction of the new pond P4A is expected to be complete by end of 2009.

Existing Catchment Description

The proposed location for the CPP extension is on the eastern side of Brennan's Creek Dam catchment and (in terms of area) is one of the smallest contributing sub-catchments. The sub-catchment (denoted in Cardno's hydrologic study as COAL_PREP) is approximately 5.52 ha, which constitutes approximately 1.2% of the 449.1 ha catchment. **Figure 17** depicts sub-catchment COAL_PREP (shown in red) with respect to the entire Brennan's Creek Dam catchment (represented by the yellow line), and **Figure 18** shows the infrastructure contained within sub-catchment COAL_PREP and its location in relation to ponds P3 and P4A.

The land within catchment COAL_PREP comprises almost entirely mining infrastructure and paved area (including the existing washery, coal bins, site offices, No. 1 ventilation shaft, a power generation plant, access roads, and car parks). Cardno's hydrology study estimates the pre-upgrade impervious area of this catchment to be approximately 85%. Runoff from this catchment drains directly to a water treatment pond known as Pond P3. Pond P3 is the third pond in a series of water treatment ponds that make up the West Cliff surface WMS. This water management system aims to detain and treat dirty water runoff from all dirty water areas before eventual release of cleaned, treated water to Brennan's Creek Dam.

Discharge of treated runoff water to Brennan's Creek Dam is diluted with clean runoff from the large undisturbed catchments to the east and west.

Effect of CPP Reliability Project

1. Runoff Rates & Volumes

Increasing the hard-standing areas within a catchment inevitably increases the volume and rate of stormwater runoff derived from the catchment. This is due to less opportunity for

stormwater infiltration into the soil and because hard-standing areas tend to be impermeable. In addition to this, stormwater infrastructure (pipes, pits, channels etc) streamline flows and enhance surface run-off.

Figure 17 – BCD Catchment with COAL_PREP Sub-catchment

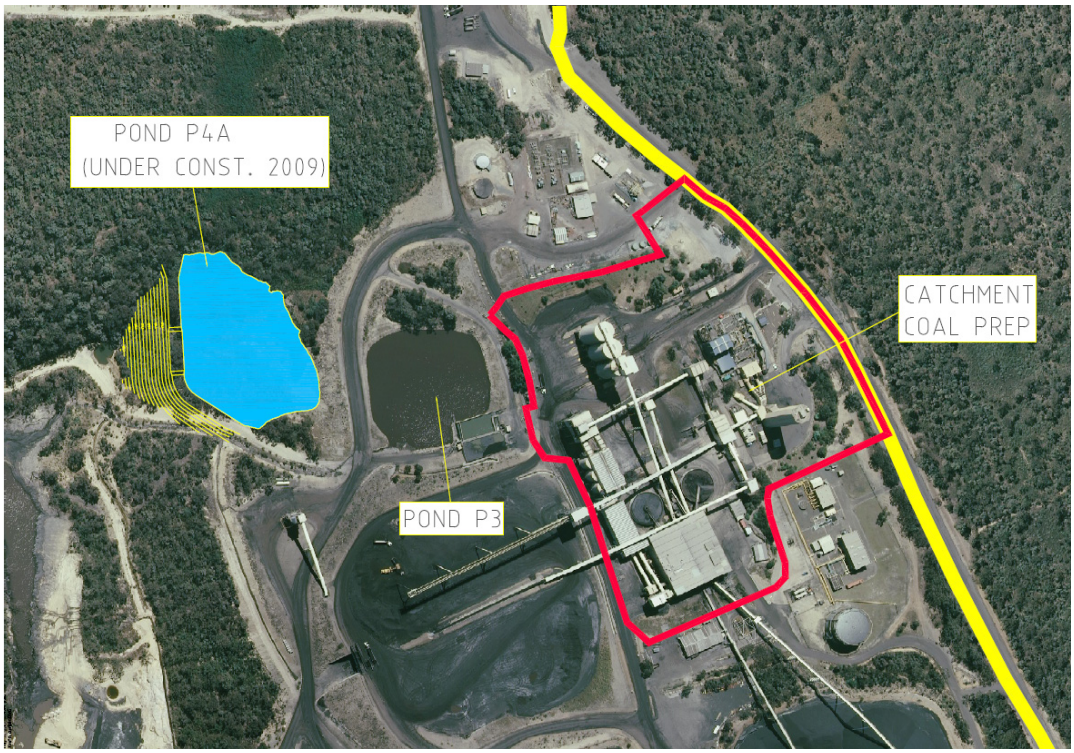


Figure 18 – COAL_PREP Sub-catchment in Relation to Water Treatment Ponds

The proposed CPP reliability project includes construction of two new buildings and an upgrade of an existing maintenance building, which will result in a total increase in impervious area of approximately 0.214 ha. This conservatively assumes that the existing area that will be occupied by the proposed CPP extensions/upgrades is currently pervious. The increase in impervious area for this catchment, resulting from these upgrades works, will be approximately 4% to 89% (up from 85%). This represents an increase in impervious area of the greater Brennan's Creek Catchment of 0.05%. This calculation is conservative, as it is likely that some of the area occupied by the proposed works is already impervious. In terms of the size of the overall catchment and the magnitude of West Cliff Collieries water infrastructure upgrade, such a small increase in impervious areas is negligible.

Table 7.2 compares the pre and post CPP reliability project peak run-off flow rates at key locations throughout the site. The results represent two scenarios. The first assumes all ponds are full at the beginning of the storm, this maximises the net effect of the proposal, i.e. the analysis is conservative. The second assumes all ponds are empty at the beginning of the storm, which more closely reflects the design parameters of the ponds. The design storm for Cardno's hydrology study (2007) was the 10-Year, 72-hour design storm and therefore this assessment reuses this storm.

Table 7.2 – Pre & Post development derived flow rates within BCD catchment

Location	Existing Peak Flow (m3/s)	Post-upgrade Peak Flow (m3/s)
SCENARIO 1 – All ponds full at beginning of storm (conservative)		
COAL_PREP	0.479	0.481
Pond 3 Outlet	0.651	0.653
Pond P4A Outlet	8.500	8.500
Brennan's Creek Dam	23.506	23.506
SCENARIO 2 – All ponds empty at beginning of storm		
COAL_PREP	0.479	0.481
Pond 3 Outlet	0.230	0.230
Pond P4A Outlet	0.000	0.000
Brennan's Creek Dam	19.106	19.106

As can be seen from **Table 7.2**, the increase in impervious area from the CPP reliability project generates an increase in peak run-off during the design storm of 2 L/s from catchment COAL_PREP, 2 L/s from Pond P3 outlet, and there is no increase in flow leaving Pond P4A. This occurs when all the ponds are full at the beginning of the storm. The results also show that if all treatment ponds are empty at the beginning of the storm (as per the design intent and operating philosophy), then there is no net increase in peak flow leaving any downstream ponds within the Brennan's Creek catchment. This is because there is sufficient storage capacity in the West Cliff Colliery surface WMS to contain all catchment flows in both the pre and post CPP reliability project scenarios.

2. Water Quality Impacts

All run-off from the works area will drain directly to water treatment pond P3 and then into pond P4A (which is currently being constructed). Run-off from the area will be treated by both passive settling and chemical dosing and, as shown above, the system has sufficient capacity to cater for the increase in impervious area. Therefore, the proposed CPP reliability project is unlikely to have any significant impact on the quality of water leaving the site.

7.3.4. Wastewater Mitigation Measures

The existing surface WMS for West Cliff Colliery pit top controls wastewater from the CPP. The WMS includes a large number of onsite drains and ponds, denoted as Ponds P1 to P7. The WMS also includes a water treatment plant (WTP) based on large concrete settling tanks near the CPP in the pit top area which employs the principles of chemically-assisted coagulation, flocculation and settling. Additional ponds have been approved for construction as part of the Stage 3 Emplacement Application and are currently in construction.

Treated water is stored in Brennan's Creek Dam (BCD) from where it is used to directly supply the Collieries water needs, which include underground mining requirements (longwall shearer, continuous miners, dust suppression etc), CPP, and bathhouse facilities with a serviceable clean water supply.

7.3.5. Actual Impacts

The proposed CPP reliability project will not have any significant environmental impacts to soil or water quality. This is because the potential for impacts is low and the existing and proposed mitigation measures will ensure that sediment, stormwater flows or wastewater cannot directly access natural watercourses.

7.4. AIR QUALITY

7.4.1. Potential Impacts

Air quality impacts from the proposed CPP reliability project will be minimal. This is because dust generated by demolition and construction activities will be contained and the duration and scale of works are small.

Dust escape during operation of the CPP is minimal and the reliability project will not alter this. The CPP generates little dust due to the nature of the coal cleaning process. The CPP uses water for the majority of its operation, so dust impacts are generally low. Coal is wet as it enters the CPP and passes through the range of processes described in **Section 4.2** that use water to clean the ROM coal. As the coal is wet, there are minimal dust emissions.

7.4.2. Construction Dust Mitigation

In accordance with EPL 2504, BHPBIC will operate and maintain the premises in a condition to minimise dust emissions. BHPBIC will maintain this during demolition, construction and operation of the proposed equipment. During demolition, construction, and particularly excavation activities, dust suppression using water carts and manual watering with hoses will be employed. Recycled water is available on the site for dust suppression.

7.4.3. CPP Operational Dust Mitigation

The CPP employs a range of dust management techniques including dust suppression at all transfer points, and scrapers on coal conveyors. The site has an Airborne Dust Management Plan, as this is a requirement under the Coal Mine Health and Safety Regulations 2006, Clause 38. The management plan primarily addresses and controls the health effects of dust

on employees. This management plan addresses hazards arising from airborne dust and makes provision for the following matters:

- Measures to minimise exposure of employees to airborne dust
- Arrangements for regular collection and analysis of dust samples
- Procedures for communication of sampling results.

West Cliff CPP also has a number of controls in place to manage dust across the pit top. The colliery has two water carts that are available for duty on a 24 hour 7 day basis, as well as a vacuum truck which cleans hardstand areas during the day shift. Cleaning of hardstand areas to minimise dust around the preparation plant area is in accordance with the West Cliff Procedure – WCP Water Cart Procedure.

Monitoring of dust deposition takes place at seven locations around the pit top, two of these are in proximity to the CPP. No change to dust deposition rates at West Cliff pit top is expected due to the CPP reliability project, as the equipment will be installed in an enclosed building, with dust suppression techniques employed.

During operation, the new equipment will employ the same dust suppression techniques as already used within the CPP. These techniques are effective in controlling dust generation and spillages. Monitoring of dust levels in the CPP and around the site will continue to ensure impacts on air quality do not increase.

7.4.4. Actual Impacts

The combination of existing dust mitigation measures at West Cliff Colliery pit top and the proposed mitigation measures during demolition and construction result in no significant air quality impact from the proposed CPP reliability project.

7.5. NOISE

7.5.1. Potential Impacts

The proposed demolition and construction activities will generate noise. Due to the distance to noise sensitive receivers, it is highly unlikely that noise from construction activities will be audible outside of the colliery boundaries.

7.5.2. Mitigation Measures

BHPBIC do not anticipate noise mitigation measures to be necessary in relation to the CPP reliability project. This is because changes in noise levels because of this project are not anticipated to have an effect on any residential receiver. This is primarily due to the significant distance to the nearest residential receiver, but also due to:

- A short construction timeframe
- Minimal project scale
- Replacing of equipment
- No alteration to current operations
- No alteration to pit top activities.

The CPP is located approximately 3.3km from the nearest house and falls within the confines of existing West Cliff CPP surface activities. Due to the distance to the nearest noise sensitive residential receivers and the assimilation of the CPP noise with other pit top operational noise it is highly unlikely that a sensitive receiver will be able to identify any difference in noise levels.

EPL 2504 does not specify any noise limits for the pit top as it is recognised that the remote location prevents any noise impacts to sensitive receivers.

Whilst the potential for additional noise from this project is very low, this EA provides an assessment of this impact. This is through consideration of noise impacts on sensitive receivers based on the Noise Study in Volume 2 (Application Report) of the 2007 'Application for Further Approval of West Cliff Emplacement Stage 3'. This Study focuses on potential new noise from emplacement activities but includes noise from other pit top operations such as the CPP.

This 2007 Noise Study identifies existing background noise levels that are relevant for current operations.

7.5.3. Summary of 2007 Noise Study

The Noise Study from the 2007 'Application for Further Approval of West Cliff Emplacement Stage 3' can be found in **Appendix D**. This section summarises the findings of that assessment.

Noise is generated from many activities at the West Cliff pit top but impacts are significantly mitigated due to the distance away from residential developments. The following methods were used to gather information for the 2007 noise study:

- Conduct site inspections and identify all noise sensitive locations
- Characterise the existing ambient and background noise environment at noise sensitive locations and key noise receiver sites in accordance with EPA guidelines
- Identify likely noise sources and activities
- Determine expected noise levels likely to be generated from noise sources
- Determine likely noise levels (via modelling) to be received at sensitive locations and compare these against relevant criteria
- Determine maximum noise levels during the night time period and analyse possible effects on sleep
- Describe appropriate mitigation measures including both engineering controls and management of impacts.

The Study uses noise monitoring results and direction from the Industrial Noise Policy to calculate the highest noise levels at the closest private lot (even though this is not a residential land use) that do not breach amenity criteria. **Table 7.3** identifies these noise levels.

Table 7.3 – Operational Site Noise Criteria

Noise Assessment Location (Receivers)	Day	Evening	Night
R33 – R38	43[1]	42[2]	38[2]

Note:

1. *Intrusiveness criteria measured in $L_{Aeq,\ 15\ minute}$*
2. *Amenity criteria measured in $L_{Aeq,\ period}$*

The 2007 Noise Study predicts future noise levels from the pit top to demonstrate that both existing and proposed activities will not breach the maximum permissible noise levels at sensitive receivers (shown in **Table 7.3**). This prediction is a worst-case scenario of all machinery operating simultaneously (where this is possible). To ensure a conservative estimate the prediction models results on both calm and windy weather conditions.

Figure 19 identifies the locations R33 to R38 and the nearest house to the CPP. **Table 7.4** shows the results of the predictive noise modelling for the various locations.

Table 7.4 – 2007 Noise Study Modelling Results

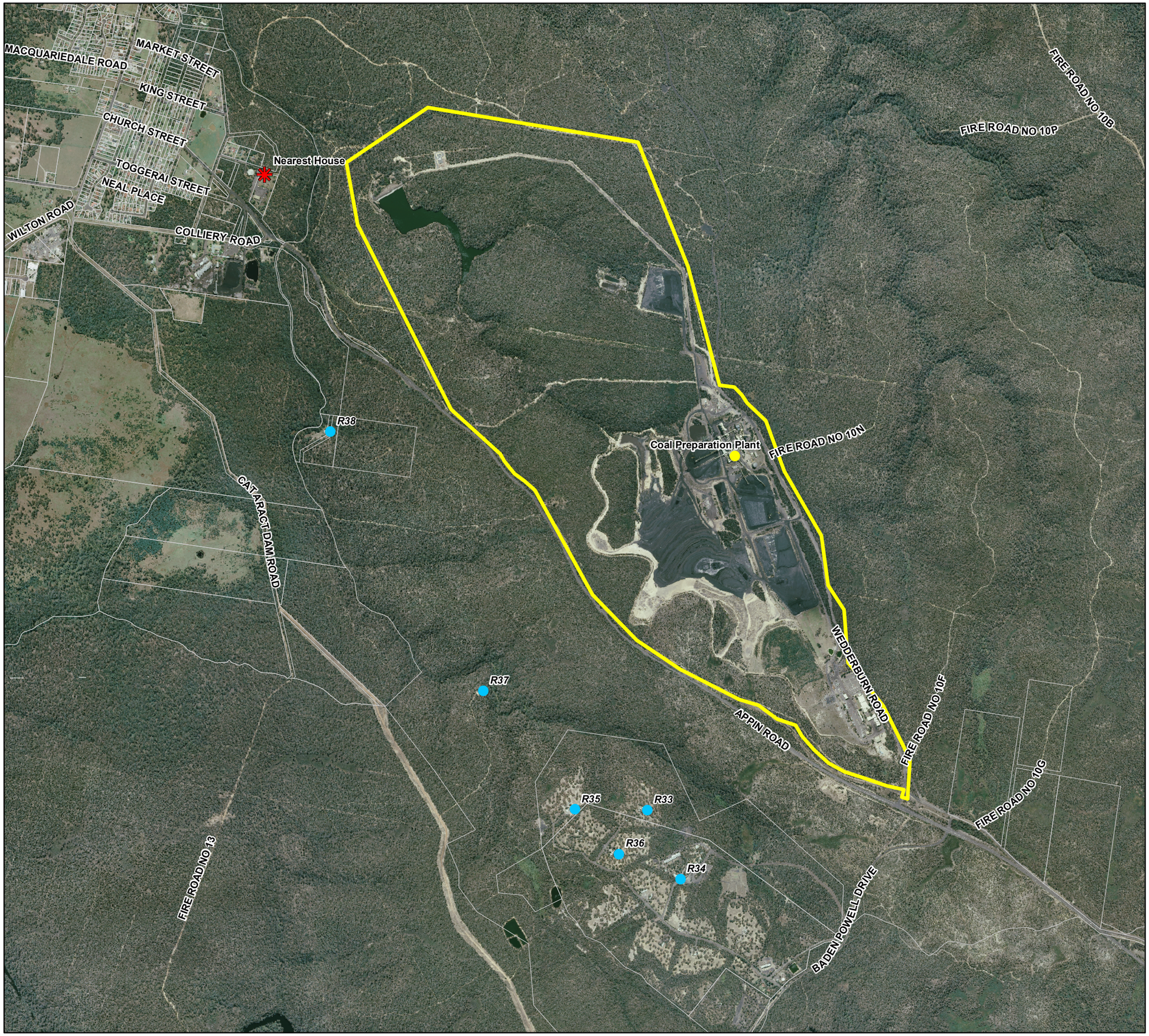
Noise Assessment Locations (Receivers)	Corresponding Noise Monitoring Location	Predicted Noise Levels dB(A) L10		Operational Noise Criteria LAeq		
		Neutral	Wind	Day	Evening	Night
R33 – Cataract Scout Park	Lot 89 Church St Appin	32	37	43	42	38
R34– Cataract Scout Park	Lot 89 Church St Appin	31	36	43	42	38
R35– Cataract Scout Park	Lot 89 Church St Appin	31	36	43	42	38
R36– Cataract Scout Park	Lot 89 Church St Appin	31	35	43	42	38
R37- Bushland	Lot 89 Church St Appin	33	37	43	42	38
R38 – Private Lot	Lot 89 Church St Appin	32	36	43	42	38

As pit top activities occur 24 hours a day and seven days per week the noise generation does not alter in relation to time. As such, there is no need to model noise generation for different parts of the 24-hour cycle.

7.5.4. Actual Impacts

The 2007 Noise Study demonstrates that in the worst-case scenario predicted noise levels from pit top activities will remain at least 2dB(A) below the most stringent noise criteria at the closest private lot. It should also be noted that this lot is not in residential use. The closest residential property to the pit top is a further 1.5km further north than this location. This will further reduce any noise impacts from the pit top.

Thus, in the unlikely event that the proposed CPP project does generate additional noise there is minimal likelihood that this will have any impact on sensitive noise receivers.



bhpbilliton
ILLAWARRA COAL

Noise Monitoring Locations

BHPBIC WEST CLIFF COLLIERY
COAL PREPARATION PLANT

Legend

- West Cliff Colliery Pit Top Lease Boundary
- Receiver Sites
- Cadastre (LPI)

N
W E
S

FIGURE 19

Scale 1:20,000 (at A3)

Metres

0 250 500 750 1,000

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 11 May 2009
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109010-02_2806_NoiseMonitoring.mxd 01

7.6. WASTE

7.6.1. Potential Impacts

The reliability project demolition and construction activities and implementation of new equipment will generate waste. The existing operation of the CPP generates waste and when the new circuits come into operation these will generate waste. Emplacement of existing waste streams occur onsite.

7.6.2. Mitigation Measures

A licensed waste management contractor controls the waste management process at West Cliff Colliery pit top. This operates through the provision of separate bins at various key locations throughout the West Cliff Colliery pit top. Employees are educated to deposit waste in the appropriate bins to reduce the requirement for later sorting in to recyclable and non-recyclables. These bins enable the separation of the following types of waste:

- Office recyclable waste (such as paper and cardboard)
- Office non recyclable waste (such as food and some containers)
- Pit top operational reusable or recyclable waste (such as timber pallets from deliveries and cardboard)
- Pit top operational non-recyclable waste (such as oils, grease and some containers).
- Scrap metal recycling.

The waste contractor attends the pit top on a regular basis to empty the various bins and remove to appropriate recycling or disposal locations.

The proposed CPP reliability project will generate waste during demolition, construction and operation. These are anticipated to generate the following waste:

- Demolition – metal, sheet steel, concrete, steel reinforcement rods, wood, nuts, bolts
- Construction – metal, wood, plastics, sheet steel, nuts, bolts, paper, cardboard, food, containers
- Operation – coal wash and water.

The demolition and construction contractor will instruct employees regarding the existing waste management system. The contractor will retain the responsibility of ensuring the correct placement of waste through the pit top management system. As the demolition and construction is small in scale and timeframe, the existing waste management system can accommodate all construction waste without amendment. Additionally, the excavated soil and rock will be used as capping material on the Stage 2 emplacement area.

The operation of the new CPP equipment will generate the same waste streams as the existing CPP. BHPBIC have approval for emplacement of the coal wash with the West Cliff Colliery lease area and this will continue following the CPP reliability project.

7.6.3. Actual Impacts

As existing waste management systems at the pit top can accommodate waste from the proposed reliability project activities there will be no significant impacts and hence no requirement for new mitigation measures.

7.7. GREENHOUSE GAS & ENERGY USE

7.7.1. Potential Impacts

The emission of greenhouse gases (GHGs) increase climate change. Current scientific advice is that this has detrimental impact on the environment such as changes to weather patterns, increase in sea level and increased intensive rainfall events. Full environmental impacts from climate change are unknown.

7.7.2. GHG Assessment

The current consensus in relation to GHG emissions is to take a conservative approach by minimising emissions to reduce associated environmental impacts. This EA abides by this approach through the following quantitative GHG assessment. The identification of GHG emissions associated with the CPP reliability project will confirm if any mitigation measures are necessary.

This GHG assessment has been undertaken using methodology outlined in the *National Greenhouse Accounts (NGA) Factors* (2008) and using emissions factors tabulated in that document and industry best practice.

The NGA Factors (2008) workbook was produced by the Commonwealth Government Department of Climate Change, and replaces the Australian Greenhouse Office (AGO) Factors & Methods Workbook (2006). All methodologies are underpinned by frameworks outlined in documents produced by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) with due regard to the Kyoto Protocol.

Policies devised by the IPCC and UNFCCC are accepted as the internationally spanning frameworks designed for intergovernmental efforts to tackle the challenges posed by climate change.

Appendix E contains a description of methodology and calculations used in this GHG assessment.

Greenhouse Gas Assessment Definitions

Consistent with the protocols of IPCC, UNFCCC, and NGA Factors (2008), three scopes of GHG emissions have been defined for this project. These include Scope 1, Scope 2, and Scope 3 emissions, each of which is defined below.

- **Scope 1** – emissions include direct emissions from sources within the boundary of an organisation such as fuel combustion and manufacturing processes.
- **Scope 2** – emissions include indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation. These result from the combustion of fuel to generate electricity, steam, or heat and do not include emissions

associated with the production of fuel. Scopes 1 and 2 are carefully defined to ensure that two or more organisations do not report the same emissions in the same scope.

- **Scope 3** – emissions include all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation. Examples include indirect emissions associated with the extraction/production of fuels used onsite, fuel extraction and line loss associated with the consumed electricity, transport of product outside the organisation, and emissions associated with end use of product.

The *Greenhouse Gas Protocol 2004* (WBCSD & WRI) considers reporting of Scope 3 emissions to be optional in the GHG inventory calculation of a project, as they are produced by third party organisations and form part of the GHG inventories of those third parties. Also, reporting Scope 3 emissions can result in double-counting of emissions and can potentially make comparisons between organisations and projects problematic, as emission values may be higher than the true value. However, in keeping with DoP desires and standard EA reporting this GHG assessment includes Scope 3 emissions.

There are numerous types of greenhouse gases (eg., carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), etc), and the global warming potential varies for each.

To allow a quantitative comparison between emissions of different types of greenhouse gases it is necessary to convert all emissions to a universally comparable unit. The methodology adapted by the NGA Factors (2008) and used in this assessment converts all emissions for non-carbon dioxide gases to a carbon dioxide equivalent (CO_2-e). Emissions from non-carbon dioxide gases are converted to t CO_2-e by multiplying the emission of each non-carbon dioxide gas by its Global Warming Potential (e.g., 1 t CH_4 = 21 t CO_2-e). The IPCC has defined the Global Warming Potential for a number of greenhouse gases and these are provided in Appendix 1 of NGA Factors (2008).

Greenhouse Gas Emissions Sources

This assessment considers emissions associated with both the development and ongoing operation phases of the project. Scope 1 emissions are point source emissions that are related to the CPP and occur within the West Cliff Colliery pit top area, or are emissions from BHPBIC controlled activities.

West Cliff CPP is an operating facility that forms part of the overall BHPBIC operations encompassing three operating mines, two CPPs, and a number of logistical operations (including coal and coal wash haulage by road and rail). The proposed CPP reliability project will not result in any change in operational activities or associated GHG emissions at any other BHPBIC sites. Changes in activities and associated GHG emissions relating to the CPP will be limited to the following.

During demolition and construction works:

- Additional contractors travelling to and from the site
- Additional machinery use to remove and construct aspects of the project
- Excavation works
- Additional haulage of materials (demolition / construction materials and machinery).

During the twelve months between May 2008 and April 2009 the existing CPP used 20,241, 403 kWh of electricity. The proposed Reliability Project equipment will require an additional 3,200 kWh per year. The proposed reliability project will result in a negligible increase in kWh electricity use over a year of 0.00016%.

The new equipment has greater torque and this needs additional electricity to power this level of torque irrespective of the coal throughput. Thus, the new equipment will require marginally more electricity than existing equipment. However, the increase in torque results in less strain on the equipment providing a more reliable system as the equipment is operating at a lower percentage of it's maximum power.

As there is less strain, the new equipment provides a more reliable system to reduce occasions when CPP operations are interrupted due to equipment failure. This reduces electricity loss or sub-optimal CPP operation and use of electricity in relation to equipment failure and equipment repair. This will assist in the CPP to become more energy efficient.

The new equipment will not cause any change to the existing operation of the CPP.

As the proposed development does not alter any activities at the pit top this assessment only calculates the increase of GHG emissions that will occur as a result of the proposed reliability project.

Table 7.5 summarises the various Scope 1, 2, and 3 GHG emissions associated with the project and included in this GHG assessment.

Table 7.5 – Scope 1, 2, & 3 Emissions from new CPP Equipment

Scope 1 Emissions	Scope 2 Emissions	Scope 3 Emissions
• Diesel consumption during demolition, earthworks and building construction (direct combustion) • Diesel consumption during transportation of construction materials and demolition/construction waste (direct combustion) • Employee travel fuel consumption (direct combustion)	• Consumption of purchased electricity (combustion generation).	• Diesel consumption during demolition, earthworks and building construction (indirect extraction) • Diesel consumption during transportation of construction materials and demolition/construction waste (indirect extraction) • Employee travel fuel consumption (indirect extraction) • Consumption of purchased electricity (fuel extraction and line loss) • Manufacture of building materials

Summary of Additional Greenhouse Gas Emissions

The Scope 1, Scope 2, and Scope 3 GHG emissions associated with the construction and operation of the CPP reliability project are summarised in **Table 7.6** and **Table 7.7**. A detailed breakdown showing each emissions source and calculations is provided in **Appendix E**.

Table 7.6 - Summary of Additional GHG Emissions from Construction of the CPP Reliability Project

Emission Scope	Increase in GHG Emission (t CO_2-e)
Scope 1	281.8
Scope 2	1.3
Scope 3	1101.8
Scope 1 + Scope 2	283.1
Scope 1 + Scope 2 + Scope 3	**1384.9**

Table 7.7 - Summary of Additional GHG Emissions from Operation of the CPP Reliability Project

Emission Scope	Increase in GHG Emission (t CO_2-e/yr)
Scope 1	0
Scope 2	2.9
Scope 3	0.5
Scope 1 + Scope 2	2.9
Scope 1 + Scope 2 + Scope 3	**3.4**

The total of all emissions (Scope 1, Scope 2, and Scope 3) yields a value of an additional 1385 t CO_2-e for the construction phase of the project, and an additional 3.4 t CO_2-e per year for the ongoing operation of the reliability project equipment. In the development phase, Scope 3 emissions make up 80% of the total emissions, while in the operational phase Scope 3 emissions make up 15% of all emissions.

The inclusion of Scope 3 emissions in total emissions, yields values higher than the actual emissions directly resulting from CPP reliability project operations. Therefore, the Scope 1 and Scope 2 emission total (2.8 t CO_2-e/yr) is a more appropriate indicator of the projects ongoing GHG emission contribution. The additional operational GHG emissions due to this project are inconsequential in relation to the amount of GHG avoided and abated by Illawarra Coal.

7.7.3. Mitigation Measures

BHPBIC are proactive in minimising their GHG emissions. This GHG assessment shows that ongoing operations of the equipment proposed by the CPP reliability project generates minimal GHG emissions. These are from the generation of purchased electricity and are difficult for BHPBIC to reduce as they are not generated by BHPBIC and the CPP requires electricity to operate.

Notwithstanding the above, BHPBIC have included the following measures within the Project design to be utilised during implementation to reduce electricity usage:

- The introduction of power factor correction on the operating plant power distribution systems
- The introduction of Soft Start technology on conveyor drives greater than 45kW
- The introduction of Variable Voltage Variable Frequency control units to adjust power consumption based on plant loadings for major process elements
- The distribution of process streams into modules to allow parts of the plant to be shutdown on periods of low demand

- The introduction of reliability engineering practices to ensure optimum machine and equipment performance.

The introduction of the above features during the project implementation stage will minimise the amount of additional power requirements for the operating plant, than that would otherwise have been required if standard direct on-line starting practices were adopted.

BHPBIC have prioritised recommendations and implemented a range of measures from an Energy Saving Action Plan for the West Cliff Colliery pit top. CPP operations are included in this Plan. This assists in reducing GHG emissions associated with the CPP and the equipment proposed by the reliability project as it seeks methods for the facility to operate with improved electricity consumption efficiency.

Some recent energy savings measures that have been implemented at the West Cliff site include:

- Provision of electrical power to the site from WestVAMP
- Installation of Variable Voltage Variable Frequency drive on the CPP reclaim conveyer
- Washdown water use and sump pump water level management
- Repair of the CPP compressor line
- CPP vacuum pump vs belt slippage optimisation.

In combination, these energy savings initiatives at West Cliff have reduced electrical energy consumption by approximately 32,000 MWh per year and Greenhouse Gas Emissions by approximately 33,700 tonnes CO_2-e per year.

BHPBIC abates approximately 3 Mtpa CO_2-e of Greenhouse Gas Emissions throughout its operations. Some of the methods for achieving this reduction are:

- Abatement of GHG emissions from coal seam methane
- Electricity generation from coal seam methane at the Energy Developments Limited (EDL) power plants at Appin No 2 Shaft and Appin West Mine
- Abatement of methane in mine ventilation air
- Generation of electricity at the WestVAMP facility at West Cliff Mine
- Flaring of goaf gas at West Cliff mine.

A proposal for additional capture and utilisation of goaf gas at Appin Mine is in preparation.

7.7.4. Actual Impacts

This assessment identifies possible GHG emissions from the West Cliff CPP reliability project, classifies them as Scope 1, Scope 2, or Scope 3 emissions, and estimates the maximum likely GHG emission from each source in accordance with the *NGA Factors (2008)*, industry best practice, and sound scientific principles. This assessment identifies opportunities and strategies for reductions in energy consumption. This investigation has revealed:

- Greenhouse gas emission point sources are from fuel consumption and purchased electricity
- Demolition and construction activities for the reliability project will generate GHG emissions
- Operation of the CPP reliability project equipment will increase GHG emissions from the CPP because of additional electricity use
- The calculated GHG emissions from the proposed development are very small in the context of BHPBIC's mining operations.

Whilst this proposal increases GHG emissions from the CPP by 2.8 t CO_2-e/yr BHPBIC is significantly reducing GHG emissions related to their other mining operations. This is through projects such as the utilisation of mine drainage gas at the Appin, Tower Energy Developments Limited power stations, Greenhouse Gas Abatement project (West VAMP), and Goaf Gas Drainage projects at West Cliff and Appin Mines. These projects relate to the removal of methane gas from areas of coal extraction areas.

The reductions in GHG emissions achieved from the abovementioned projects are many orders of magnitude greater than the increase in emissions associated with the CPP reliability project and are thus justifiable.

Additionally, the slight increase in GHG emissions is acceptable as the CPP will be more reliable. This is important as additional GHG emission may occur if the CPP breaks down. These would be from coal oxidation during stockpile storage whilst the CPP is inoperable and then diesel used to power frontend loaders to load stockpiled coal back into the CPP. A reliable CPP will reduce the chances of failure and the possibility of associated increased GHG emissions.

Overall GHG emissions from the construction and operation of the CPP reliability project are minor. Whilst it is preferable to avoid increases in GHG emissions BHPBIC offset these by proposed significant reductions in emissions from their other activities and they are justified as the development protects against CPP failure and subsequent financial impacts and additional GHG emissions.

8. SECONDARY ENVIRONMENTAL IMPACTS

This section assesses secondary environmental impacts from the proposed CPP reliability project.

8.1. ECOLOGY

8.1.1. Potential Impacts

The southern CPP extension is the only aspect of the reliability project that necessities vegetation removal. The removal of this small amount of vegetation has no significant impact. This is justified by the following assessment.

The area immediately surrounding the existing CPP has been subject to extensive disturbance over a period of about 20 years resulting in minimal remaining habitat. Within the footprint of the proposed CPP reliability project there is some planted vegetation of low ecological value consisting of approximately 10 individuals of *Leptospermum sp (continentale)* shrubs less than 3m in height (refer to **Figure 20**). The proposed works will remove this vegetation.

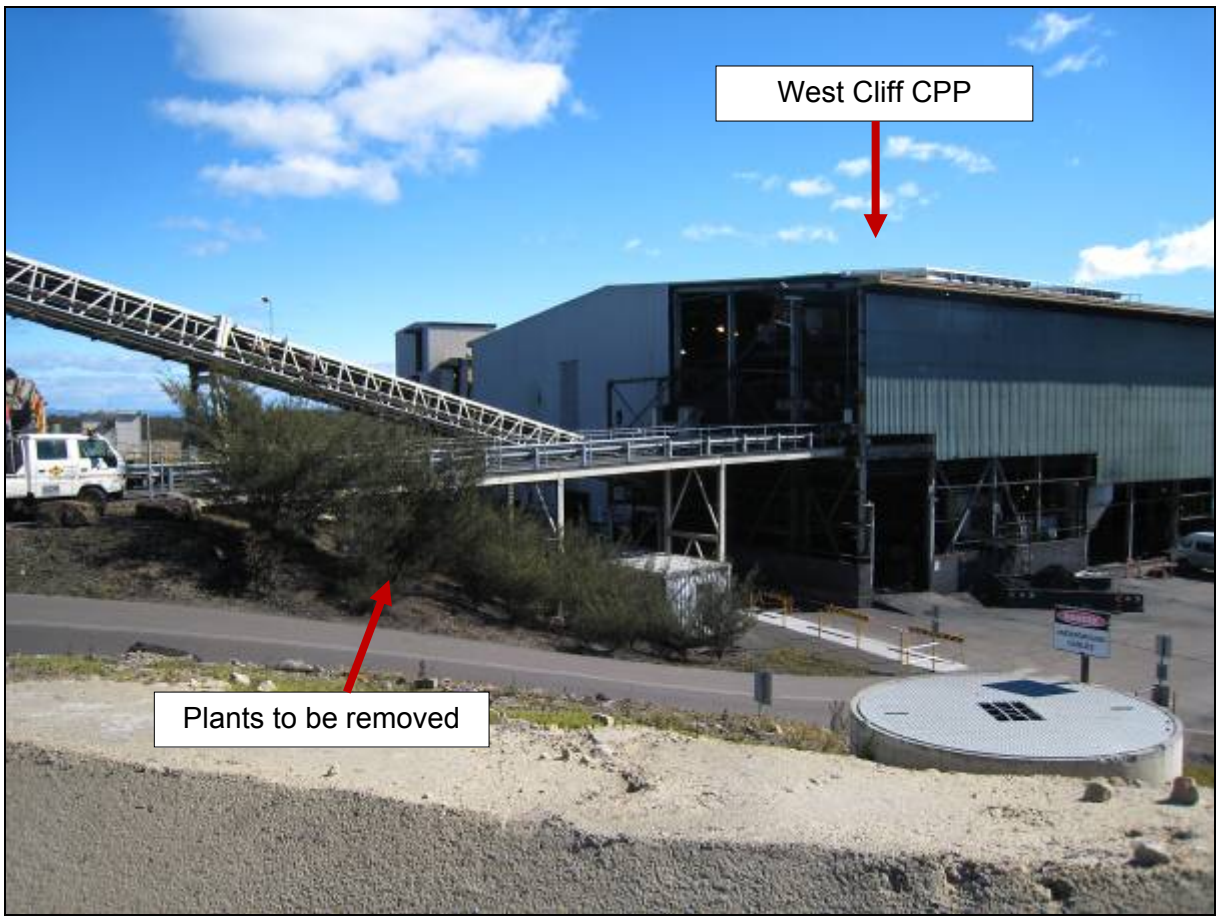


Figure 20 – *Leptosermum sp (continentale)* Plants

Although impacts from the proposal on flora and fauna are deemed minimal, a review has been conducted of previous Flora and Fauna Impact Assessments conducted in the area to identify any species that may be affected by the proposal.

The current application site is within the development footprint of the CCP approved in 1975. In the Environmental Impact Statement (EIS) prepared for that application, the removal of vegetation is not a significant issue. The EIS met relevant contemporary standards relating to vegetation removal by identifying that the amount of vegetation for removal is small in comparison to other larger areas of similar bush nearby.

Consolidated Coal Lease 724 permits vegetation removal as follows:

> *"The registered holder shall carry out operation in such a manner as to interfere as little as possible with natural flora and fauna and shall not cut or damage any tree shrub or other vegetative cover except as shall directly obstruct or prevent the carrying out of operations"*

The most recent and comprehensive flora and fauna assessment for the area was the *West Cliff Colliery – Stage 3 Coal Wash Emplacement Application – Volume 3 Species Impact Statement (SIS)* conducted by Biosis Research in 2007. The study area for this SIS includes the development area for this proposal. Biosis surveyed for flora and fauna using the random meander method. Biosis did not detect any threatened species in the immediate vicinity of the CPP or within the proposed development footprint.

Historical vegetation communities at the CPP site are *Exposed Sandstone Scribblygum Woodland* (ESSW) with some *Sandstone Ridgetop Woodland* (SRW) and potentially *Sandstone Gully Peppermint Forest* (SGPF). All of these vegetation communities are located in close proximity to the CPP within the Mining Purposes Lease, along with revegetated emplacement areas. None of the above vegetation communities are classified as Endangered Ecological Communities, or critical habitat, under the *Threatened Species Conservation Act* 1995 however they can support some threatened species of flora and fauna.

Three threatened plant species, *Acacia bynoeana (*Vulnerable TSC Act*)*, *Persoonia hirsuta* (Endangered on TSC and EPBC Acts) and *Pultanaea aristata (*Vulnerable on TSC and EPBC Acts) are in the immediate vicinity of West Cliff Colliery pit top. Several threatened species of fauna, the Broad-headed Snake, Common Bent-wing Bat, Large-footed Myotis, Powerful Owl and Rosenberg's Goanna are known to inhabit the area.

The removal of shrubs by the proposed CPP southern building extension are not considered habitat for any of the threatened fauna species that have been observed in the area. Due to the limited potential for ecological impacts from the CPP Reliability Project, a flora and fauna impact assessment was not deemed necessary.

8.1.2. Mitigation Measures

As the removal of the limited vegetation near the CPP has no environmental impact, there is no requirement for any mitigation measures.

8.1.3. Actual Impact

The removal of the limited vegetation has no environmental impact.

8.2. ABORIGINAL & EUROPEAN HERITAGE

8.2.1. Potential Impacts

There is only minimal potential that excavation works for the CPP extensions and new maintenance building will encounter any heritage items. This is justified by the following assessment.

A search of the following heritages registers does not identify any European or Aboriginal heritage at the West Cliff Colliery pit top:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- Register of the National Estate
- NSW State Heritage Register
- Wollondilly LEP 1991 Heritage Schedule.

Biosis Research, a specialist environmental and heritage consultancy have completed many Aboriginal heritage assessments for BHPBIC within the West Cliff Colliery pit top area. These have always focused on the undisturbed areas of the pit top prior to any new developments affecting such locations. However, Biosis have no record of any heritage item close to the CPP.

As the area of the pit top that includes the CPP, the Coal Winder, the No. 1 Ventilation Shaft, site offices and associated infrastructure is significantly disturbed from mining activities there is no reasonable chance that this area will include any Aboriginal heritage. Additionally, the previous owners excavated this area to rock level during construction of the pit top facilities. This activity will have removed any Aboriginal item that may have been on the site.

8.2.2. Mitigation Measures

As there is a low chance of heritage impacts, specific mitigation measures are unnecessary. However, if any heritage items are discovered work will cease and BHPBIC will contact DECC.

8.2.3. Actual Impacts

This EA concludes that the proposed CPP reliability project is unlikely to have any impact on European or Aboriginal heritage due to the location of the works and previous land disturbance.

8.3. VISUAL

8.3.1. Potential Impact

There is no opportunity for construction equipment (such as cranes), the new CPP extensions or the new maintenance building to have a visual impact on sensitive receivers. This is justified in the following assessment.

The facility is located well away from sensitive visual corridors and is not a location identified for scenic value. The West Cliff site is on a natural high point in the surrounding area, however the topography and dense tree cover prevent views of the CPP from outside the site boundaries. The proposed works will only be visible from within West Cliff site as it is located on ground that is lower than much of the surrounding pit top area.

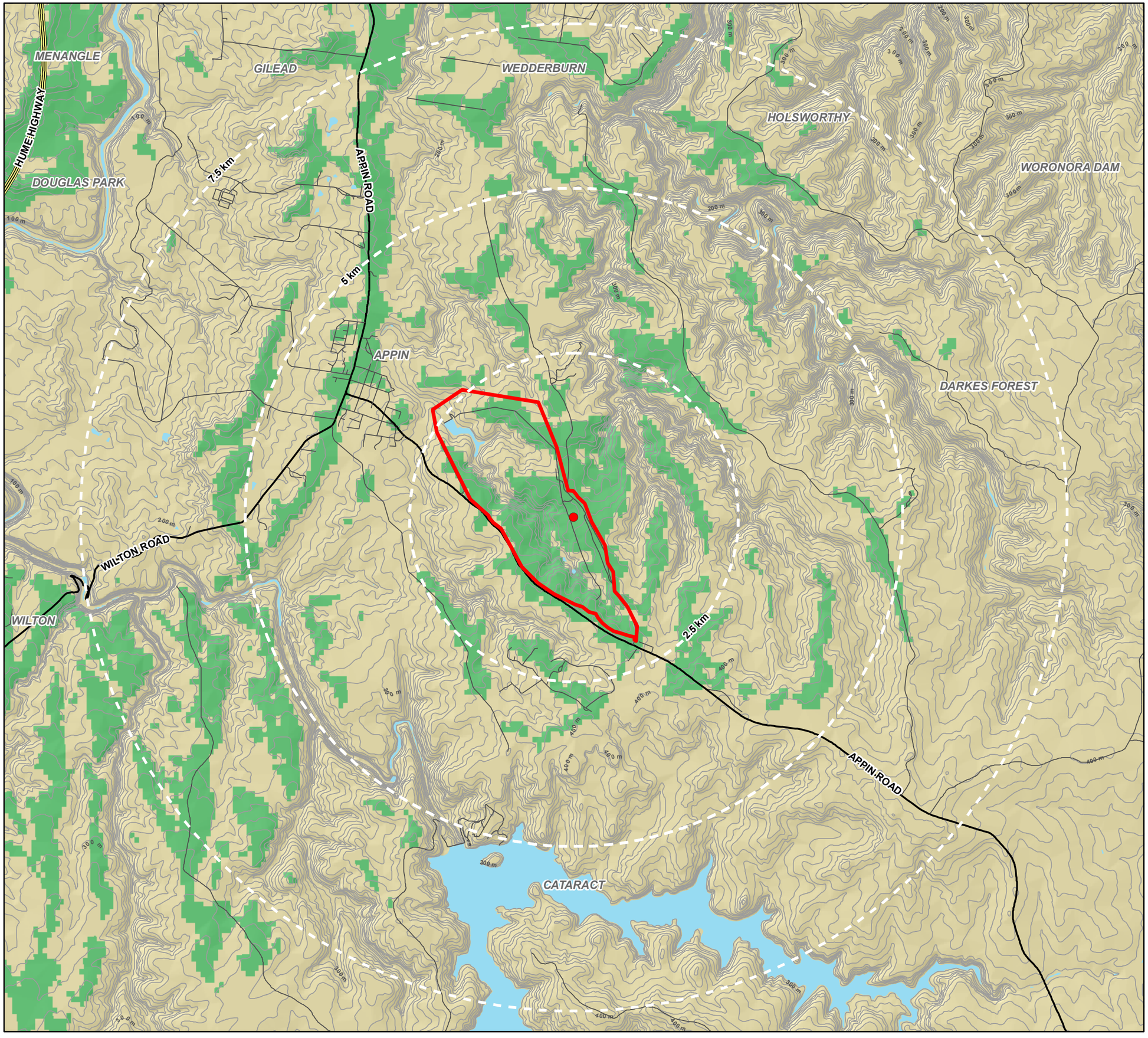
Figure 21 is a viewshed analysis of the area around the West Cliff Colliery centred on the CPP building. This figure demonstrates locations from where the highest point of the proposed extension is visible based on topography. The viewshed analysis is a useful tool for identifying areas that the proposed works could have a visual impact on, however as this cannot take into account trees, buildings or objects that may block sightlines above topography the results require further assessment.

Many locations that the viewshed analysis shows could see the proposed works are not sensitive to visual intrusion as they are either not publically accessible or are not in residential use. Therefore, even if the proposed CPP building extensions are visible there is no detrimental impact.

The viewshed analysis does indicate that topography allows the CPP location to be visible from the following three key locations:

1. A small section of Appin Road close to the pit top lease boundary
2. Part of the Appin residential area (around Kennedy Street, King Street and Market Street)
3. George Street, Appin.

Visual impacts on these key locations will not occur. This is because views from these locations are blocked by matures trees that surround the West Cliff Colliery pit top or trees around the identified key locations. This results in no visual effects to any locations that may be sensitive to visual intrusion.



bhpbilliton
ILLAWARRA COAL

Viewshed Analysis

BHPBIC WEST CLIFF COLLIERY
COAL PREPARATION PLANT

Legend

- West Cliff Colliery Pit Top Lease Boundary
- Coal Preparation Plant - Highest point following extensions = 27m
- Motorway
- Arterial Road
- Local Road
- 10m Contours
- Major Waterbodies
- Coal Preparation Plant Not Visible
- Coal Preparation Plant Visible

N
W E
S

FIGURE 21

Scale 1:55,000 (at A3)

Kilometres
0 0.5 1 2 3 4

Cardno Forbes Rigby

Map Produced by Cardno Forbes Rigby Pty Ltd
Date: 26 February 2008
Coordinate System: Zone 56 MGA/GDA 94
GIS MAP REF:
109010-02_2801_ViewshedAnalysis.mxd 02

All data sourced/derived from Department of Lands (LPI)

Figures 22 to **24** show views towards the West Cliff Colliery pit top from the locations that may be visually sensitive.

This photo is adjacent to the West Cliff Colliery pit top lease boundary, the surface facilities are approximately 1.2km north of this location. The mature trees prevent views of the CPP and the proposed extensions.

Figure 22 – View North West along Appin Road

The mature trees surrounding houses prevent views of the CPP or proposed works.

Figure 23 – View South East along King Street

The mature trees along Church Street block views of the pit top.

Figure 24 – View South East along Church Street

These photographs confirm the pit top infrastructure will not be visible from any sensitive receivers. Additionally, visual impacts will be further reduced as the construction of the CPP extensions and maintenance building will be of similar materials to the existing CPP and will assimilate into the look of the existing Plant. Thus, the proposed works will not be a prominent feature within the existing developments.

8.3.2. Mitigation Measures

As there will be no visual impact to any sensitive locations, there is no need for any mitigation measures.

8.3.3. Actual Impacts

Due to the location of the pit top and mature trees surrounding this area there will be no visual impacts on sensitive receivers.

8.4. CONTAMINATION

8.4.1. Potential Impacts

The chances of the proposed works areas containing contamination are remote thus potential impacts are negligible. The land has no previous use other than CPP hardstand, embankment or natural soil and before this the area was natural bushland.

BHPBIC are aware of the composition of the land under the topsoil or hardstand in the proposed work areas for the CPP reliability project. This is because the land was excavated to rock level to lay foundations during the construction of CPP infrastructure. Following completion of the foundations, the excavated soil was backfilled. BHPBIC are not aware of any contamination in the proposed area. The land has never been used for tipping or hazardous purposes.

8.4.2. Mitigation Measures

As chances of environmental impacts from contamination are remote, there is no requirement for mitigation measures.

8.4.3. Actual Impacts

This assessment concludes there will be no impacts from contamination.

8.5. UTILITIES

8.5.1. Potential Impacts

Electricity, gas and telecommunications service West Cliff Colliery. The proposal will not require any additional utility services as existing services can accommodate the extra demand from the equipment installed during the project. Electricity to power the new equipment for the CPP will be available from recent upgrades to the sites power network.

As no new services are required, there will not be any environmental impacts from utilities.

8.5.2. Mitigation Measures

As there are no impacts, there is no requirement for mitigation measures.

8.5.3. Actual Impacts

There will not be any environmental impacts associated with utility services from the CPP reliability project.

8.6. CUMULATIVE IMPACTS

The location of the West Cliff Colliery away from other developments means there are no practical possibilities of development's from other proponents having a cumulative impact with the CPP reliability project. This section of the EA assesses the proposal cognisant of other BHPBIC developments at West Cliff Colliery.

Cumulative impacts relate to compounding effects and interactions arising from developments proposed or under implementation within the locality or at a similar time that together impact on the natural or built environment. Cumulative impacts could have significant affect if any of the environmental impacts from the proposed CPP project (identified in **Table 6.2**) combine with the same environmental impact from another new or existing development and result in mitigation or control measures not sufficiently minimising the impact.

The assessment of cumulative impacts ensures consideration of environmental impacts from the CPP project is not isolated from surrounding developments. Developments with potential to contribute to cumulative environmental impacts in conjunction with the CPP reliability project are considered other activities proposed by BHPBIC at the West Cliff Colliery pit top.

8.6.1. Diesel Storage & Refuelling Facility

This is a new diesel refuelling facility for coal trucks and BHPBIC surface mobile equipment (front-end loaders, utes, cars etc.). It will replace the existing refuelling point at West Cliff Colliery and is to be located off Wedderburn Road.

This development is a 'Major Project' and has been approved by the DoP under Part 3A of the EP&A Act. The environmental impacts from the Diesel Project that may have cumulative impacts with the CPP reliability project are:

1. Surface water runoff
2. Waste management
3. Climate change
4. Noise.

Both the Diesel Project and the CPP reliability project have minimal increase in surface water runoff, waste streams and greenhouse gas emissions. The existing West Cliff Colliery surface water management system and the waste management system are able to accommodate the additional inputs from both developments. This will ensure there are no environmental impacts in breach of EPL 2504.

The direct (Scope 1) GHG emissions from both projects are nil or very minor. Additionally, the Diesel Project is a replacement for the existing refuelling facility and the CPP reliability project partly replaces existing equipment. This results in the minimal new GHG emissions and noise from the West Cliff Colliery pit top and a minor cumulative GHG and noise impact.

8.7. OVERVIEW OF MITIGATION MEASURES

Sections 7 & **8** identify and assess environmental impacts from the proposed CPP reliability project. Existing and proposed controls or mitigation measures are discussed as necessary in relation to the specific impact. **Table 8.1** lists the existing or proposed mitigation measures that this EA identifies as required for the proposed CPP reliability project for ease of reference.

Table 8.1 – Overview of Mitigation Measures

Environmental Impact	Mitigation Measure
Soil & Water Quality	**Demolition & Construction** - The contractor will prepare and implement a Demolition & Construction Management Plan that includes an Erosion and Sediment Control Plan.
	Demolition & Operation - There is no requirement to alter the existing West Cliff Colliery surface water management system as this can successfully capture, retain and treat the minor additional run-off from the CPP extensions and new maintenance building.
Air Quality	**Demolition & Construction** – suppression of dust using water carts.
	Operation – Continued management of dust escape in accordance with EPL 2504. New mitigation measures are not necessary as the use of water in the CPP prevents dust escape.
Noise	**Demolition & Construction** – no mitigation necessary as there will no impact on sensitive receivers.
	Operation - no mitigation necessary as there will be no impact on sensitive receivers.
Waste	**Demolition & Construction** – no specific mitigation required as waste from the reliability project can be accommodated by the existing West Cliff Colliery waste management system.
	Operation – There will be no additional waste from the CPP due to the proposed reliability project. The existing West Cliff Colliery waste management systems will continue to ensure appropriate waste removal and recycling.
Greenhouse Gas & Energy Use	**Demolition & Construction** – Specific mitigation measures are not necessary as the demolition & construction period will be short and only require a small number of employees and machinery.
	Operation – the reliability project will only result in a minimal increase in GHG emissions associated with the CPP. BHPBIC will continue to use their Energy Saving Action Plan to minimise these emissions.

As the potential environmental impacts are minor, and all of the impacts are mitigated by existing measures at West Cliff Colliery, the proposed CPP reliability project will operate in compliance with legislation and the conditions in EPL 2504. Thus, additional environmental controls under the authority of this Part 3A Application in relation to the CPP are not considered necessary.

9. DEMOLITION & CONSTRUCTION MANAGEMENT

This section describes the procedures BHPBIC will employ to ensure safety at work and minimise environmental impacts.

A number of contracting firms will carry out different aspects of the proposal. However, BHPBIC will maintain responsibility for the environmental management of the proposal and is certified to the ISO 14001 Environmental Management Standard.

9.1. ENVIRONMENTAL MANAGEMENT PLAN

The contractor appointed to undertake demolition & construction works will prepare Health, Safety and Environmental documentation that will include details of the environmental controls for the worksite. Compliance with the following requirements will be a minimum:

- All staff will be briefed on environmental controls prior to the commencement of work
- Mitigation measures for control of erosion and water pollution in accordance with the soil and construction handbook (Soils and Construction, Volume 1, 4th edition March 2004, LANDCOM).
- Plant will be inspected on arrival to site and prior to use to ensure it is complies with its safety specifications
- Daily inspection of plant to ensure it remains safe for use
- Inductions of all workers to the West Cliff Site.

9.2. DEMOLITION & CONSTRUCTION SAFETY

All work carried out at West Cliff Colliery pit top must be covered by a Permit to Work authority, which is issued by the CPP Personnel. The Contractor will be required to complete a risk assessment in relation to activities involved in the demolition and construction aspects of the project. Once approved by BHPBIC the risk assessment will form part of the Permit to Work that controls all safety management aspects of the development.

Workplace safety is of highest importance to BHPBIC and relevant measures are in place to increase safety. These include:

- Site induction including safety awareness and hazard specific training
- Mandatory wearing of the following personal protective equipment:
    - Steel toe-capped footwear
    - Hard hat
    - High visibility vest or coat
    - Hand protection
    - Eye protection
    - Hearing protection (wherever applicable).

In addition to compliance with site safety regulations, protective equipment and attendance at site induction the Contractor will be responsible for the safety of their employees and sub-contractor employees. The Contractor will ensure staff at West Cliff CPP will undertake all necessary safety precautions at all times.

9.3. EQUIPMENT INSPECTION

All motorised plant in use during demolition or construction by the Contractor or subcontractors will be subject to Statutory Inspection by the Mine Electrical and Mechanical Engineers. The construction work will meet Coal Mine Safety equipment requirements. Any equipment, which does not meet relevant standards, will be removed from site.

9.4. POLLUTION CONTROL MEASURES

The Contractor will be required to ensure that appropriate measures are in place to ensure control of stormwater and silt runoff during demolition and construction. Such measures will include silt fencing and diversion drains. These will direct water to existing surface water management systems at West Cliff Colliery.

The Construction Management Plan will detail all such protection measures and compliance with these during demolition and construction will be mandatory.

10. STATEMENT OF COMMITMENTS

This section sets out commitments that BHPBIC will abide by upon approval of this Part 3A application.

Preceding chapters have described environmental impacts and mitigation measures in relation to the proposed CPP reliability project. The following commitments aim to ensure ongoing protection of the environment, employees and equipment.

Subject to approval of the project, BHPBIC will commit to the following controls as detailed in **Table 10.1**.

Table 10.1 – Statement of Commitments

Objective	Commitment
Soil & Water Quality	
• Minimise pollution of natural watercourses. • Minimise erosion.	• Demolition and construction works shall be undertaken in accordance with an Erosion and Sediment Control Plan. • All surface water run-off from the CPP and new maintenance building shall be captured and treated by the existing West Cliff Colliery water management system. • All surface water run-off from the CPP and new maintenance building shall comply with requirements of West Cliff Colliery Environmental Protection Licence 2504.
Air Quality	
• Minimise impacts from dust generation.	• Suppression of dust using water carts during demolition, construction and operation.
Waste	
• Capture and transfer of waste to suitable disposal location. • Recycling of waste where appropriate.	• Control of waste streams from the CPP reliability project through the West Cliff waste management system. • Waste from demolition and construction of the CPP reliability project will be sorted and recycled via the existing West Cliff Colliery waste management systems.
Greenhouse Gas & Energy Use	
• BHPBIC will minimise GHG emissions related to the CPP.	• BHPBIC will ensure the new equipment operates efficiently to minimise electricity usage.
Demolition & Construction Management	
• Minimise impact on environment from works. • Ensure employee safety during construction.	• The successful construction contractor will prepare a safe work method statement for approval by BHPBIC prior to work commencing. • The Contractor will maintain equipment to a safe standard. • The Contractor will prepare a Construction Management Plan that includes an Erosion and Sediment Control Plan for BHPBIC approval prior to the commencement of works.

Public Consultation	
• Provide a public opportunity to comment on ongoing operations at West Cliff Colliery.	• BHPBIC will continue to operate the 24-hour telephone line to provide an alternative method for public information. • BHPBIC will continue to support the Appin Area Community Working Group and associated liaison activities to ensure the local community have an opportunity to raise any questions regarding the CPP reliability project.

11. CONCLUSION

This section concludes the Environmental Assessment.

BHP Billiton Illawarra Coal (BHPBIC) Pty. Ltd. operates West Cliff Colliery Coal Preparation Plant (CPP). BHPBIC are seeking consent under Part 3A of the Environmental Planning & Assessment Act (EP&A) 1979 to replace older components of the CPP in two major extensions to the existing CPP building and ancillary developments. This replacement will ensure the ongoing reliability of the CPP to process coal to meet customer requirements.

BHPBIC propose to extend the existing CPP building to the south and the west to house the main aspects of the new equipment. The extensions will be of a comparable size, scale and appearance to the existing building. The southern extension will replace a small area of soil and landscaping and the western extension will be located on an existing hardstand area. A new Band Press Filter and Horizontal Belt Filter as extensions to equipment are also proposed to improve CPP reliability. The proposed CPP works also require the relocation of the existing maintenance building and result in conveyor Co 6/21 becoming redundant.

The proposed reliability project will replace parts of the CPP that are aging with new technology that is more efficient and less likely to be affected by break-downs or be out of service for repairs. This assists BHPBIC to meet customer requirements for coal shipments and maintain customer satisfaction. The continued success of coal mining is important to the economic vitality of the Illawarra region due to the number of residents directly or indirectly employed by mining activities and the revenue for local and State governments.

A reliable CPP will also minimise the chances of additional GHG emissions associated with the preparation process. Additional GHG emissions could result from the additional stockpiling of coal followed by transportation from the stockpile back to the CPP in the event of a CPP breakdown. A reliable CPP will therefore allow BHPBIC to more effectively manage GHG emissions from their mining activities.

Section 2 of this EA assesses the CPP reliability project in accordance with relevant legislation and Environmental Planning Instruments including the EP&A Act 1979. This assessment shows the reliability project complies with relevant policies. **Section 2.2.1** of this report focuses on the EP&A Act objectives and demonstrates the proposal is consistent with these where relevant.

Environmental impacts from the proposal are minimal due to the minor scope of works. The Director-General's Requirements identifies the following as key environmental issues associated with this project:

- Soil & Water Quality
- Air Quality
- Noise
- Waste
- Climate Change.

This report assesses these issues and additional secondary environmental impacts. These assessments confirm that the CPP reliability project has no significant environmental impact. However, this report recommends some mitigation measures to ensure ongoing protection of the environment. These include:

- Implementation of an Erosion and Sediment Control Plan
- Use of a water cart to control dust emissions during demolition & construction
- Continued operation of the West Cliff Colliery pit top waste management system to manage waste from the CPP reliability project.

The CPP Reliability Project is small in comparison to the scale of other mining activities at the pit top. As demonstrated by this Environmental Assessment report the project will have minimal impacts but has significant benefits of allowing BHPBIC greater certainty of maintaining economic benefits for the Illawarra by meeting customer requirements.

This project fits with BHPBIC's ongoing plans for mining operations through West Cliff Colliery pit top and is associated with the current 'Bulli Seam' Part 3A application for continuing mining operations (see below). On balance, the CPP Reliability Project has no significant environmental impacts, supports planned ongoing mining operations, and assists to ensure economic stability.

11.1. ASSOCIATION WITH OTHER MAJOR PROJECT

BHPBIC are also preparing a Major Project Development Application MP 08_150 under Part 3A of the EP&A Act 1979 for the continuation of mining operations at West Cliff and Appin Colliery (commonly referred to as the 'Bulli Seam Project'). This application will incorporate pit top activities including the West Cliff CPP.

In order to ensure the reliability of the CPP BHPBIC wish to conduct the works described in this EA immediately. Due to this, BHPBIC are seeking the approval for these works prior to the submission of the Bulli Seam Project Environmental Assessment.

BHPBIC recognise that the approval of this Part 3A application to improve the reliability of the CPP shall cease to have force and effect subsequent to the granting of any project approval under Part 3A of the EP&A Act 1979 for the Bulli Seam Project.

12. REFERENCES

This section references the material used during the preparation of this EA.

ABARE, 2006, Economic Impact of Climate Change Policy: The Role of Technology and Economic Instruments

BHP Billiton Illawarra Coal Pty. Ltd., 2008, West Cliff Coal Preparation Plant Options Report.

Biosis Research, 2007, WestCliff Colliery – Stage 3 Coal Wash Emplacement Application – Volume 3 Species Impact Statement.

Biosis Research, 2006, West Cliff Colliery Stage 3 – Coal Wash Emplacement Natural and Cultural Heritage Rapid Assessment.

Biosis Research, 2001, Dendrobium Coal Project: Terrestrial and Aquatic Habitat Assessment.

Cardno Forbes Rigby, 2007, Surface Water Hyrdologic Study West Cliff Colliery Stage 3 Emplacement.

Cardno Forbes Rigby, 2007, Application for Further Approval of West Cliff Emplacement Stage 3, Application Report.

Commonwealth Government, 1999, Environment Protection & Biodiversity Conservation Act 1999

Commonwealth Government Department of Climate Change, 1990, Tracking to the Kyoto Target, Australia's Greenhouse Emissions Trends, 1990 to 2008-2012 and 2020

Commonwealth Government Department of the Environment and Water Resources, 2005, State and Territory Greenhouse Gas Inventories 2005

Landcom, 2004, Managing Urban Stormwater, Soils & Construction, Volume 1.

NSW Department of Planning, 1997, Illawarra Regional Environmental Plan No. 1.

NSW Department of Planning, 2005, State Environmental Planning Policy – Major Projects.

NSW Department of Planning, 2006, Illawarra Regional Strategy 2006-31.

NSW Department of Planning, 2007, State Environmental Planning Policy – Mining, Petroleum Production and Extractive Industries.

NSW Greenhouse Office, 2005, NSW Greenhouse Plan, November 2005

NSW State Government, 1979, Environmental Planning & Assessment Act 1979.

NSW State Government, 1974, National Parks & Wildlife Act 1974.

NSW State Government, 1992, Mining Act 1992.

NSW State Government, 1995, Threatened Species Conservation Act 1995.

NSW State Government, 1997, Protection of the Environment Operation Act 1992

The Coal Cliff Collieries, 1975, Environmental Impact Study, West Cliff Mine.
The World Business Council for Sustainable Development and World Resources Institute, 2004, Greenhouse Gas Protocol 2004

Wikipedia, 2008, Coal Preparation Plant, www.wikipedia.org.

Wollondilly Shire Council, 1991, Wollondilly Local Environmental Plan 1991

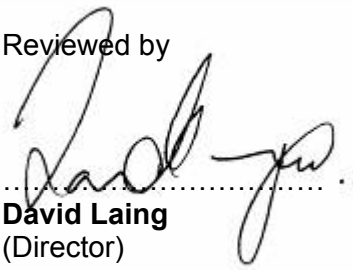
Wollondilly Shire Council, 1991, Development Control Plan 36 – Development in Rural Areas.

Wollondilly Shire Council, 2008, Strategic Planning Section of Council Website - http://www.wollondilly.nsw.gov.au/planning/1328/12638.html.

Prepared by
for and on behalf of
FORBES RIGBY PTY LTD

……
Philip Paton
(Town Planner)

Reviewed by



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David Laing
(Director)

Cardno Forbes Rigby Pty Ltd
278 Keira Street
WOLLONGONG NSW 2500
Telephone: (02) 4228 4133
Facsimile: (02) 4228 6811

APPENDIX A

DIRECTOR-GENERAL'S REQUIREMENTS

NSW GOVERNMENT
Department of Planning

Major Project Assessment
Industry & Mining
Phone: (02) 9228 6339
Fax: (02) 9228 6466
Email: alison.thomas@planning.nsw.gov.au
Room 305
23-33 Bridge Street
GPO Box 39
SYDNEY NSW 2001

Our Ref: 9041467-7

Mr James Anderson
Environment and Community Coordinator
Processing and Logistics
BHP Billiton - Illawarra Coal
PO Box 514
UNANDERRA NSW 2526

Dear Mr Anderson

Director-General's Requirements
West Cliff Colliery Coal Preparation Plant Reliability Project
Project Application Number: 08_0243

The Department has received your application for the Coal Preparation Plant Reliability Project.

I have attached a copy of the Director-General's requirements for the project.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit your Environmental Assessment (EA) for the project. This will enable the Department to determine the:

- applicable fee (see Division 1A, Part 15 of the Environmental Planning and Assessment Regulation 2000);
- consultation arrangements; and
- number of copies (hard-copy and CD-ROM) of the EA that will be required.

The Department is required to make all the relevant information associated with the project publicly available on its website. Consequently, I would appreciate it if you would ensure that all the documents you subsequently submit to the Department are in a suitable format for the web, and arrange for an electronic version of the EA to be hosted on a suitable website.

If you have any enquiries, please contact Alison Thomas on 9228 6339.

Yours sincerely

22.12.08

Chris Wilson
Executive Director
Major Project Assessment
As delegate for the Director-General

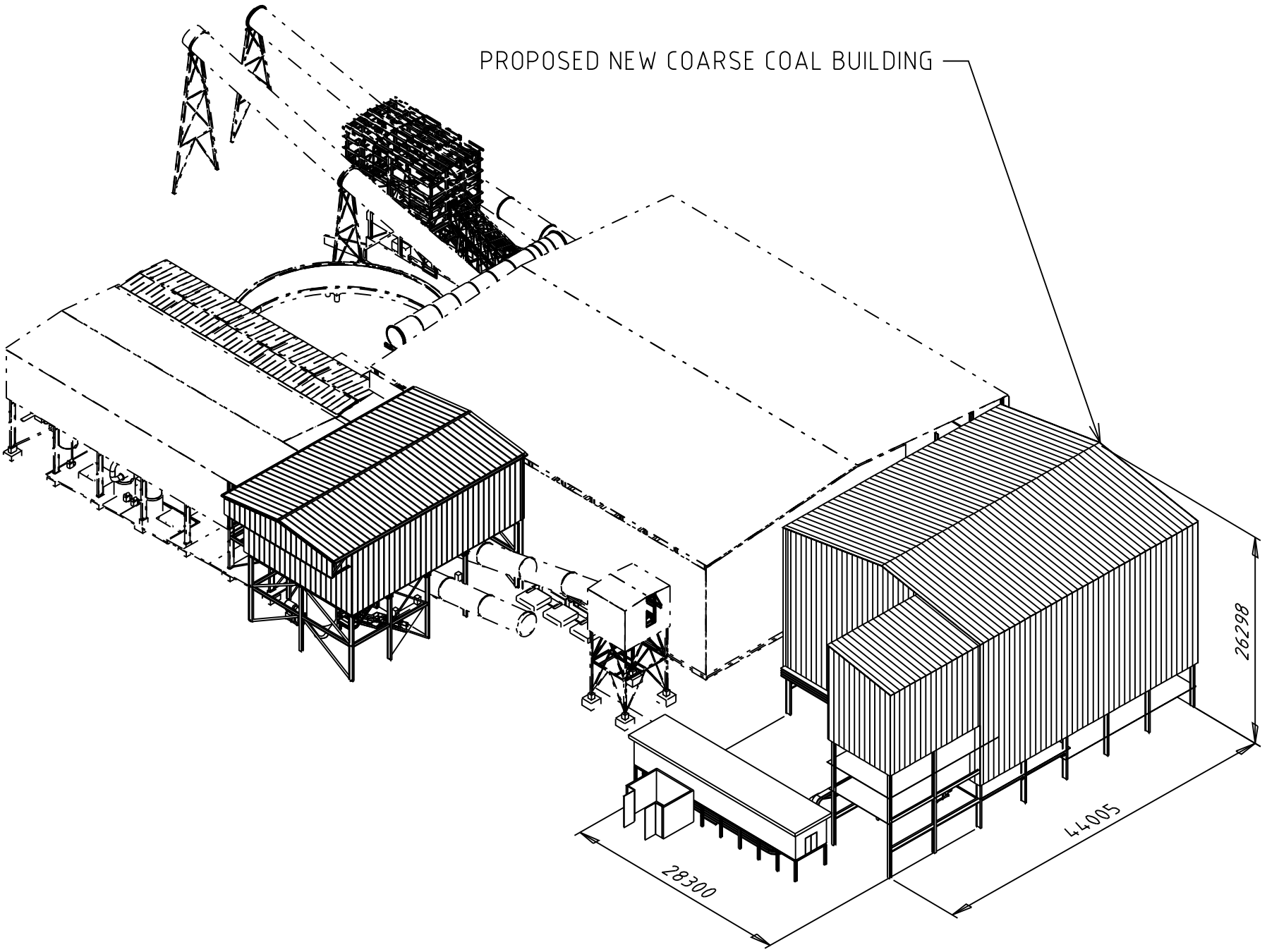
Director-General's Requirements

Section 75F of the *Environmental Planning and Assessment Act 1979*

Application Number	08_0243
Proposed Project	The West Cliff Coal Preparation Plant (CPP) Reliability Project.
Location	West Cliff Colliery approximately 3.8km south of Appin
Proponent	BHP Billiton Illawarra Coal Holdings Pty Ltd
Date of Issue	22 December 2008
General Requirements	The Environmental Assessment of the project must include: • a detailed description of the project, including the need for the project; • a detailed assessment of the key issues specified below, which includes: - a description of the existing environment; - an assessment of the potential impacts of the project, taking into consideration any relevant policies, guidelines, and statutory provisions; and - a description of the measures that would be implemented to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project; • a general assessment of any other potential impacts of the project; • a statement of commitments, outlining all the proposed environmental management and monitoring measures; • a conclusion justifying the proposal, taking into consideration whether it is consistent with the objects of the *Environmental Planning & assessment Act 1979*; and • a signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.
Key Issues	• **Design** – including plans and elevations for the extension to the southern end and western side of the existing CPP building. • **Soil & Water** – including the proposed erosion and sediment controls during construction, stormwater management once constructed and wastewater management during operation; • **Air Quality** – demonstrate that all reasonable and feasible measures have been incorporated to minimise dust impacts during construction and operation; • **Noise** – including any potential additional noise impacts during construction and operation; • **Waste** – including management of waste during construction and operation; and • **Greenhouse Gas & Energy Use** – including: - a quantitative assessment of the greenhouse gas emissions of the project, and qualitative assessment of the potential impacts of these emissions on the environment; and - a detailed description of the measures that would be implemented on site to ensure that the project is energy efficient.
Consultation	During the preparation of the Environmental Assessment, you should consult with relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners.
Deemed refusal period	30 days

APPENDIX B

DESIGN DRAWINGS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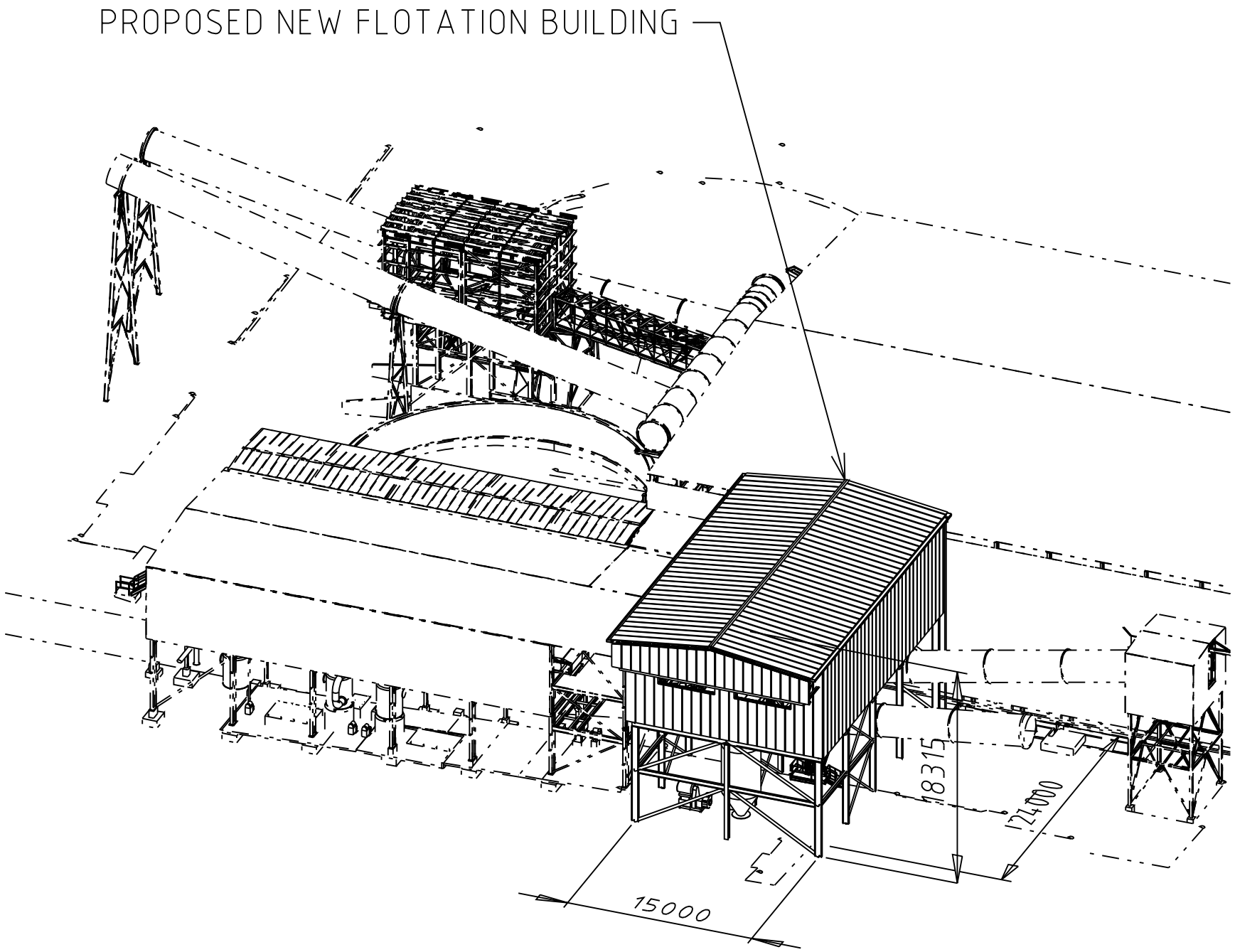
PROPOSED NEW FLOTATION BUILDING
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15000

APPENDIX C

ENVIRONMENTAL PROTECTION LICENCE 2504

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 2504

Department of **Environment & Climate Change** NSW

Licence Details	
Number:	2504
Anniversary Date:	01-February
Review Due Date:	01-Feb-2010

Licensee

ENDEAVOUR COAL PTY LIMITED
PO BOX 514
UNANDERRA NSW 2526

Licence Type

Premises

Premises

WESTCLIFF AND NORTHCLIFF COLLIERIES
WEDDERBURN ROAD
APPIN NSW 2560

Scheduled Activity

Coal Mines
Coal Works

Fee Based Activity	**Scale**
Coal Mining (26)	> 2000000 - 3500000 T produced

Region

Metropolitan
Level 3, NSW Govt Offices, 84 Crown Street
WOLLONGONG NSW 2500
Phone: 02 4224 4100
Fax: 02 4224 4110

PO Box 513 WOLLONGONG EAST
NSW 2520

Environment Protection Licence

Licence - 2504

Department of Environment & Climate Change NSW

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

ENDEAVOUR COAL PTY LIMITED
PO BOX 514
UNANDERRA NSW 2526

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 Not applicable.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity
Coal Mines
Coal Works

Fee Based Activity	Scale
Coal Mining (26)	> 2000000 - 3500000 T produced

A1.3 Not applicable.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
WESTCLIFF AND NORTHCLIFF COLLIERIES
WEDDERBURN ROAD
APPIN
NSW
2560
DEPARTMENT OF MINERAL RESOURCES DIAGRAM 1140 AND POR ML 39
WESTCLIFF COLLIERY HOLDING AND NORTHCLIFF COLLIERY HOLDING

A2.2 The premises also includes the North Cliff Colliery located at Lot 7014 DP 103029 and Consolidated Coal Lease 724 as shown on the map provided to the EPA 9 May 2003 attached to letter dated 8 May 2003.

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

Electricity Generating Works

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and

(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
5	Discharge to air; Air emissions Monitoring	Discharge to air; Air emissions Monitoring	Exhaust referred to as "Vocsidiser No. 1 Exhaust" on diagram titled "BHPB Drawing No. D714-030-DU-001" dated 24 November 2004.
6	Discharge to air; Air emission monitoring	Discharge to air; Air emission monitoring	Exhaust referred to as "Vocsidiser No. 2 Exhaust" on diagram titled "BHPB Drawing No. D714-030-DU-001" dated 24 November 2004.
7	Discharge to air; Air emission monitoring	Discharge to air; Air emission monitoring	Exhaust referred to as "Vocsidiser No. 3 Exhaust" on diagram titled "BHPB Drawing No. D714-030-DU-001" dated 24 November 2004.
8	Discharge to air; air emission monitoring	Discharge to air; air emission monitoring	Exhaust referred to as "Vocsidiser No. 4 Exhaust" on diagram titled "BHPB Drawing No. D714-030-DU-001" dated 24 November 2004.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Environment Protection Licence

Licence - 2504

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
1	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge to waters Discharge quality monitoring Volume monitoring	Overflow from West Cliff Colliery dam labelled as 001 'Discharge from Brennan's Creek Dam' on map titled "West Cliff EPA Licence Authorised Discharge Points, DP-2672A" forwarded to the EPA with the Licence Information Form.
2	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge to waters Discharge quality monitoring Volume monitoring	Overflow from North Cliff Colliery's sedimentation dam labelled 001 'Overflow from sedimentation dam' on map titled ' West Cliff Mine No. 3 &4 Shafts EPA Licence Authorised Discharge Points, faxed to the EPA on 4 July 2001.
3		Discharge to utilisation area.	Spray irrigation on grassed utilisation area shaded as '002 Spray Irrigation' on the Map titled "West Cliff - EPA Licence Authorised Discharge Points, DP-2672A" forwarded to the EPA with the Licence Information Form.
4	Discharge Quality Monitoring. Volume Monitoring.		Effluent irrigation pump discharging to POINT 3

3 Limit conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Load limits

L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

L3.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table/s.

Air

POINTS 5,6,7,8

Pollutant	Units of measure	100 percentile concentration limit
Nitrogen Oxides	milligrams per normalised cubic metre	10

Water and Land

POINT 2

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				50

POINT 3

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5 - 8.5
Total suspended solids	milligrams per litre				50
Biochemical oxygen demand	milligrams per litre				30

L3.4 The reference basis for the air pollutants specified in Condition L3.3 for Points 5-8 is as follows:

For Nitrogen Oxides: dry, 273 K, 101.3kPa (%O_2 to be specified in accordance with Condition U2 of Attachment A, Development Consent I 946-02 dated 17 June 2003).

L4 Volume and mass limits

L4.1 For each discharge point or utilisation area specified below (by a point number), the volume/mass of:

(a) liquids discharged to water; or;

(b) solids or liquids applied to the area;

must not exceed the volume/mass limit specified for that discharge point or area.

Point	Unit of measure	Volume/Mass Limit
3	kilolitres per day	200

L5 Waste

L5.1 Not applicable.

L6 Noise Limits

L6.1 Not applicable.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

O4 Management of utilisation area

O4.1 Effluent application must not occur in a manner which causes surface runoff.

O4.2 Spray from effluent application must not drift beyond the boundary of the premises.

O4.3 The quantity of effluent/solids applied to the utilisation area must not exceed the capacity of the area to effectively utilise the effluent/solids.

For the purpose of this condition, 'effectively utilise' include the use of the effluent/solids for pasture or crop production, as well as the ability of the soil to absorb the nutrient, salt, hydraulic load and organic material.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Arsenic	micrograms per litre	Special Frequency 1	Grab sample
Chemical oxygen demand	milligrams per litre	Special Frequency 2	Grab sample
Conductivity	microsiemens per centimetre	Special Frequency 2	Grab sample
Copper	micrograms per litre	Special Frequency 1	Grab sample
Methylene Blue Active Substances	milligrams per litre	Special Frequency 2	Grab sample
Nickel	micrograms per litre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 2	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample
Zinc	micrograms per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 2	Grab sample

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 2	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample
pH	pH	Special Frequency 2	Grab sample

POINT 4

Pollutant	Units of measure	Frequency	Sampling Method
Biochemical oxygen demand	milligrams per litre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample

POINTS 5,6,7,8

Pollutant	Units of measure	Frequency	Sampling Method
Nitrogen Oxides	milligrams per normalised cubic metre	Quarterly	TM-11

Note: **'**Special Frequency 1' is defined as:

"once a month (at intervals of no greater than 5 weeks apart) and during discharge times."

Note : 'Special Frequency 2' is defined as:

"The sampling is to commence as soon as practicable after the commencement of the discharge (in the case of intermittent discharges over one month, not more than one sample is required in any one week)"

M2.2 The monitoring results collected at Point 4 in compliance with Condition M2.1 can be used to determine compliance with the concentration limits specified in Condition L3.3 for discharge from Point 3.

Note: Following the submission of the Annual Return in 2006, the EPA will review the above monitoring pollutants for Point 1 which may result in the licence being varied.

M2.3 Note: Following the first twelve months of operation of the Electricity Generating Works, and subject to the EPA being satisfied with the first twelve months of monitoring results, the sampling frequency at Points 5-8 may be varied to Annual, or as otherwise agreed.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or

(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or

(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or

(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:

(a) the volume of liquids discharged to water or applied to the area;
(b) the mass of solids applied to the area;
(c) the mass of pollutants emitted to the air;

at the frequency and using the method and units of measure, specified below.

POINT 1

Frequency	Unit Of Measure	Sampling Method
Special Frequency 3	kilolitres per day	Special Method 1

POINT 2

Frequency	Unit Of Measure	Sampling Method
Daily during any discharge	kilolitres per day	Special Method 1

POINT 4

Frequency	Unit Of Measure	Sampling Method
Special Frequency 4	kilolitres per day	In line instrumentation

Note: 'Special Method 1' is defined as:

"Visual Staff Height measurement with calibrated V-notch weir structure."

Note: 'Special Frequency 3' is defined as:

"Daily during discharge. In the event a discharge volume could not be taken on any one day from POINT 1, the volume discharged from POINT 1 during that one day may be estimated mathematically by averaging the total estimated volume recorded the previous day and the following day. This estimation method may be used not more that six times during the licence reporting period."

Note: 'Special Frequency 4' is defined as:

Calculating by inline instrumentation every Monday, Tuesday, Wednesday, Thursday, Friday and Saturday. The volume discharged during any Sunday and Monday may be estimated mathematically by dividing by 2 the cumulative flow rate monitored and recorded each Monday."

M6.2 The monitoring results collected at Point 4 in compliance with Condition M6.1 can be used to determine compliance with the volume limit specified in Condition L4.1 for discharge from Point 3.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
(a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
(a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
(b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
(a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
(b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
(a) the cause, time and duration of the event;
(b) the type, volume and concentration of every pollutant discharged as a result of the event;

(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Signage

G2.1 Each monitoring and discharge point must be clearly marked by a sign that indicates the EPA point identification number.

Pollution studies and reduction programs

Pollution Reduction Programs (PRPs) – Completed

PRP No	PRP	Description	Completed Date
1	Discharge Water Quality	To chemically characterise the quality of the water discharges from Brennans Creek Dam and the chemical impacts on the ambient water quality of the Georges River	6 Mar 2003
2	Appin Colliery Mine water Trial	To determine the impact on the water quality of the Brennans Creek water system from the use of imported saline Appin Colliery mine water in the Westcliff Coal Preparation Plant.	Removed from licence June 2004 – PRP no longer required
3	Effluent Utilisation Area	To provide a detailed report on the operation of the effluent treatment plant and the irrigation utilisation area	20 Feb 2004
4	Georges River Ecological Assessment Report	The aim of this PRP is to provide a report to investigate if there is an ecologically significant impact on the surface waters receiving the treated mine waters discharged from point 2 is occurring, including Brennans Creek and the Georges River.	5 June 2004
5	Coal Tracking from Truck Wash	The aim of this study is to recognise and address the issue of coal fine tracking from the premises given the potential for this to cause pollution of waters.	1 Sept 2005
6	Georges River Ecological Assessment	The aim of this PRP is to investigate and report on the surface waters receiving the mine waters discharged from Westcliff Colliery premises, including Brennans Creek and the Georges River, to determine if any ecologically significant impact is occurring.	3 Jan 2005

U1 **Pollution Reduction Program No 7. – Brennans Creek Discharge Trial**

Aim: The aim of this PRP is to trial controlled discharges of water from Brennans Creek Dam (bottom waters) and the Reclaim Pond (the "Trial") in an endeavour to minimise the frequency of rain induced uncontrolled releases over the dam spillway. The releases will be undertaken in an effort to optimise the salinity and control the pH of discharges.

U1.1 The Trial must be undertaken in accordance with the document provided to the EPA titled "West Cliff Colliery Water Management System Proposed Pollution Reduction Program Trial" prepared by Ecoengineers Pty Ltd, March 2004 Revision 5.

U1.2 For the purposes of the Trial, the following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
10	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge to waters Discharge quality monitoring Volume monitoring	Piped discharge from the Brennans Creek Reclaim Dam as shown on the map titled 'Westcliff BCD Water Release System General Arrangement' Drawing Number DP 3460 dated 17.6.04
11	Quality monitoring		Georges River located approximately 50 meters upstream of the confluence with Brennans Creek
12	Quality monitoring		Georges River located approximately 50 meters downstream of the confluence with Brennans Creek

U1.3 For the discharge point specified in the table below (by a point number), the concentration of a pollutant discharged at that point must not exceed the concentration limits specified for that pollutant in the table.

U1.4 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

POINT 10

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	mg/L				10
pH	PH				6.5 - 8.5
Total suspended solids	mg/L				50

U1.5 For each monitoring/discharge point specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

POINT 10

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	uS/cm	Special Frequency 5	In situ
Conductivity	uS/cm	Special Frequency 1	Grab sample
Oil and Grease	mg/L	Special Frequency 1	Grab sample
Total suspended solids	mg/L	Special Frequency 1	Grab sample
pH	pH	Special Frequency 5	In situ
pH	pH	Special Frequency 1	Grab sample
Arsenic	ug/L	Special Frequency 1	Grab sample
Copper	ug/L	Special Frequency 1	Grab sample
Nickel	ug/L	Special Frequency 1	Grab sample
Zinc	ug/L	Special Frequency 1	Grab sample
Iron	ug/L	Special Frequency 1	Grab sample

POINT 11

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	uS/cm	Special Frequency 5	In situ
pH	pH	Special Frequency 5	In situ

POINT 12

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	uS/cm	Special Frequency 5	In situ
pH	pH	Special Frequency 5	In situ

U1.6 For the purposes of condition U3.5 Special Frequency 5 means every day with the exception of weekends and public holidays.

U1.7 For the purposes of condition U3.5 Special Frequency 1' means once a month (at intervals of no greater than 5 weeks apart) and during discharge times.

U1.8 The licensee must use in-situ instrumentation when monitoring for the concentration of pH and conductivity at points 10, 11 and 12 at the frequency defined by Special Frequency 5 in compliance with condition U3.5. The in-situ instrumentation used must be operated and calibrated in accordance with manufacturers specifications for that instrument.

U1.9 The licensee must prepare and submit an interim and final written report to the Department of Environment and Conservation Manager Sydney Industry in accordance with section 4 of the document detailed in Condition U3.1.

U2 Pollution Reduction Program No 8. – Materials Storage

U2.1 The aim of this PRP is to ensure materials are stored at the premises in a way which contains leaks and spills and minimises odour and dust generation.

U2.2 The licensee must prepare and submit to the EPA a report that details a program of works to be undertaken to ensure materials are correctly stored and bunded, that is, compliant with the requirements of:

- *Australian Standard AS 1940B1993: The Storage and Handling of Flammable and Combustible Liquids; and*
- *Australian Standard AS 4452B1997: The Storage and Handling of Toxic Substances* the *Dangerous Goods Act 1975.*

This program of works must cover waste oil tanks, waste oil drums, on site fuel storage and on site chemical and materials storage, including stone dust, and include timelines for all construction work necessary.

It is the intention of the EPA to issue a subsequent PRP requiring the licensee to implement the outcomes of this PRP.

COMPLETION DATE: 30 April 2005

U3 Pollution Reduction Program No 9. – Georges River Ecological Assessment (Continuation)

U3.1 The aim of this PRP is to further investigate and report on the surface waters receiving the mine waters discharged from Westcliff Colliery premises, including Brennans Creek and the Georges River to determine if any ecologically significant impact is occurring.

U3.2 The licensee must repeat the ecological assessment described and timetabled in the document titled 'Ecological effects of water discharges from Appin and Westcliff Collieries' by Dr Marcus Lincoln Smith and dated 21 April 2004 and attached to letter dated 19 May 2004 signed Gary Brassington Environmental Coordinator Illawarra Steel Carbon Steel Materials BHP Billiton a further two times, in two successive seasons, that is Spring and Autumn.

The licensee must prepare and submit to the EPA a written report detailing the outcomes of the ecological assessment.

Completion Date: 31 March 2006

Special conditions

E1.1 Not applicable.

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
industrial waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
inert waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
reprocessing of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
treatment of waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste code	Means the waste codes listed in Appendix 5 of the EPA document A Guide to Licensing Part B.
waste type	Means Group A, Group B, Group C, inert, solid, industrial or hazardous waste

Ms Debbie Maddison

Environment Protection Authority

(By Delegation)

Date of this edition - 30-May-2007

End Notes

1	Licence varied by notice 1008874, issued on 09-Jan-2002, which came into effect on 09-Jan-2002.
2	Licence transferred through application 141377, approved on 08-Aug-2002, which came into effect on 01-Jul-2002.
3	Licence varied by correction to EPA Sub Region data record, issued on 17-Sep-2002, which came into effect on 17-Sep-2002.
4	Licence varied by notice 1025524, issued on 10-Jul-2003, which came into effect on 04-Aug-2003.

End Notes

5	Licence varied by notice 1029826, issued on 15-Oct-2003, which came into effect on 22-Oct-2003.
6	Licence varied by notice 1034664, issued on 11-May-2004, which came into effect on 05-Jun-2004.
7	Licence varied by notice 1037771, issued on 18-Jun-2004, which came into effect on 13-Jul-2004.
8	Licence varied by notice 1040023, issued on 20-Sep-2004, which came into effect on 15-Oct-2004.
9	Licence varied by notice 1041777, issued on 25-Oct-2004, which came into effect on 19-Nov-2004.
10	Licence varied by correction to EPA Region, issued on 22-Nov-2004, which came into effect on 22-Nov-2004.
11	Licence varied by notice 1043281, issued on 06-Jan-2005, which came into effect on 31-Jan-2005.
12	Licence varied by change to EPA file number, issued on 02-Feb-2005, which came into effect on 02-Feb-2005.
13	Licence varied by notice 1046029, issued on 05-Apr-2005, which came into effect on 30-Apr-2005.
14	Licence varied by change to DEC Region allocation, issued on 16-Mar-2006, which came into effect on 16-Mar-2006.
15	Licence varied by notice 1073110, issued on 30-May-2007, which came into effect on 30-May-2007.

APPENDIX D

2007 NOISE ASSESSMENT

7.3. NOISE IMPACTS

7.3.1. Overview

Noise is generated on the emplacement site from coal wash haul trucks and earthmoving equipment. The noise impact from these operations are mitigated by the emplacement being located in a valley and at a distance of 1.5km to 2.5km from the nearest residential development. There have been no recorded noise complaints regarding the emplacement operations.

Renzo Tonin and Associates (2001) carried out a noise and vibration impact assessment for the proposed Dendrobium project, which was included in the EIS.

The study assessed noise emissions from the construction and operational phases of the project, including West Cliff Emplacement Stages 1, 2 and 3.

To assist in addressing these issues, the existing ambient noise environment was characterised by conducting site inspections and long term noise monitoring on site near major potential noise sources.

Representative existing base-line noise levels were monitored and the potential future impacts predicted and assessed at key noise receiver areas including West Cliff Emplacement Area.

Noise and vibration emissions were assessed against relevant guidelines and criteria set out in the NSW EPA's "Industrial Noise Policy", "Environmental Criteria for Traffic Noise, "Environmental Noise Control Manual" and relevant Australian Standards.

7.3.2. Methods

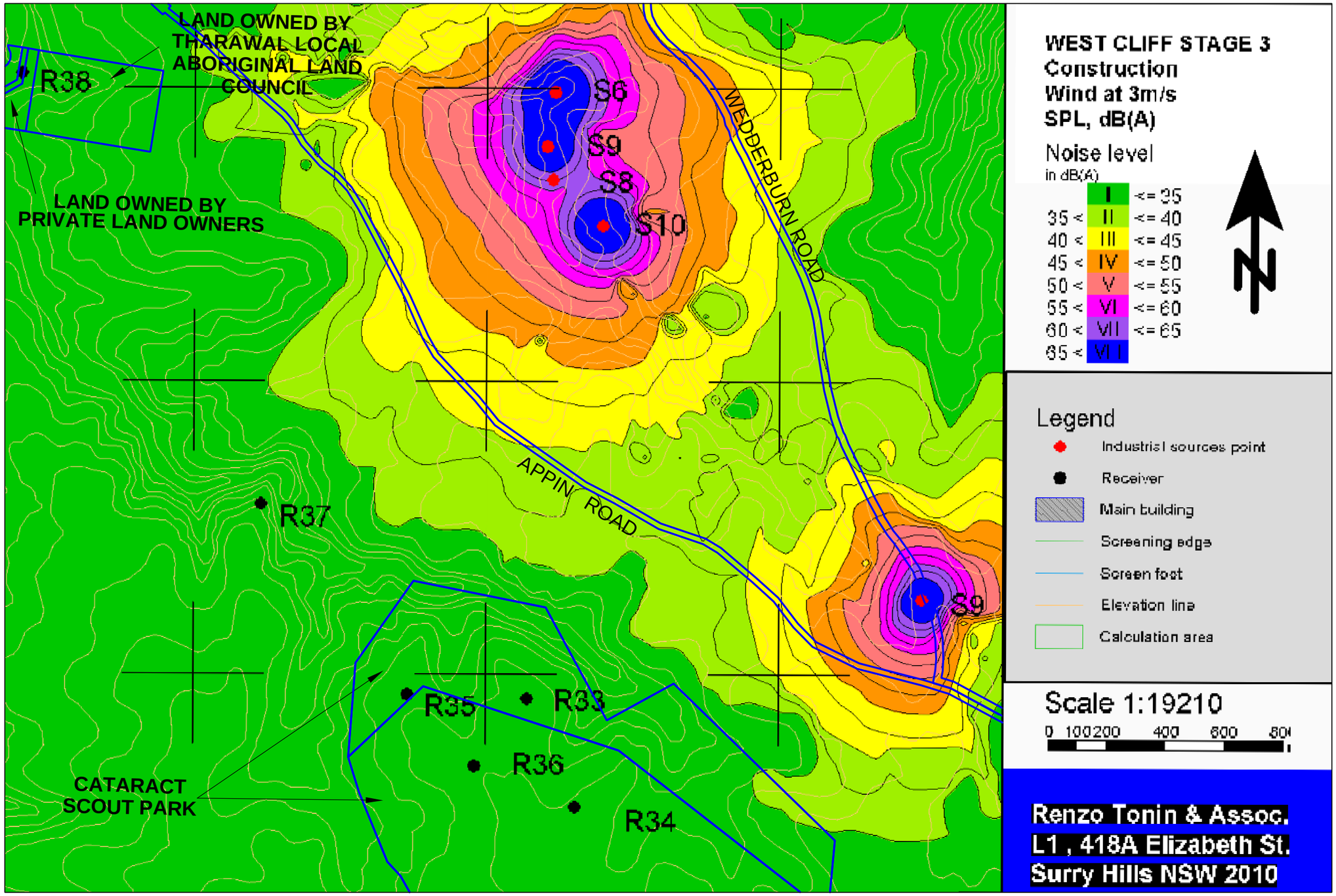
In summary, the noise impact assessment used the following methods:

- Conduct site inspections and identify all noise sensitive locations.
- Characterise the existing ambient and background noise environment at noise sensitive locations and key noise receiver sites in accordance with EPA guidelines.
- Identify likely noise sources and activities.
- Determine expected noise levels likely to be generated from noise sources.
- Determine likely noise levels (via modelling) to be received at sensitive locations and compare these against relevant criteria.
- Determine maximum noise levels during the night time period and analyse possible effects on sleep.
- Describe appropriate mitigation measures including both engineering controls and management of impacts.

7.3.3. Results

Background and ambient noise levels were determined by long term measurements taken over more than ten days at locations selected to best represent an area likely to be most affected by noise from the operations. At West Cliff this was Lot 89 Church St Appin. Refer **Figure 7.5**.

WEST CLIFF COLLIERY
PROPOSED STAGE 3 EMPLACEMENT AREA



SOURCE: Renzo Tonin & Associates 2001.

CONSTRUCTION NOISE MODELLING RESULTS

FIGURE 7.5

bhpbilliton ILLAWARRA COAL

Cardno Forbes Rigby

CFR REF: 107045-01-1053_R0

Table 7.1 summarises the existing L_{90} background and L_{eq} ambient noise levels representative for each day, evening and night period determined in accordance with the EPA INP

Table 7.1 – Existing background (L_{90}) and ambient (L_{eq}) noise levels dB(A)

Monitoring Location	(L_{90}) Background Noise levels[1]			(L_{eq}) Ambient Noise levels[2]		
	Day	Evening	Night	Day	Evening	Night
Lot 89 Church St Appin	38	37	36	58	54	48

1. *Rating Background Level*
2. *Existing L_{eq} noise level (logarithmic average)*

Source: Renzo Tonin and Associates (2001)

7.3.4. SITE NOISE – OPERATIONAL PHASE

The assessment procedure in terms of the NSW EPA's 'Industrial Noise Policy' (INP) has two components:

1. Controlling intrusive noise impacts in the short term for residences

2. Maintaining noise level amenity for particular land uses for residences and other land uses.

7.3.5. Intrusive Noise Impacts

According to the EPA's INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the LAeq descriptor), measured over a 15-minute period, does not exceed the background noise level measured in the absence of the source by more than 5dB(A).

The intrusiveness criterion from the EPA's INP is summarised as follows:

$L_{Aeq,15\ minute} \leq L_{A90}$ background noise level plus 5dB(A)

The intrusiveness criteria for each assessment location are presented below in **Table 7.2**.

Table 7.2 – Operational Site: Intrusive Noise Criteria, dB(A)

Noise Assessment Locations (Receivers)	Corresponding Noise Monitoring Location	Background Noise Levels L_{A90} (RBL)			Intrusive Noise Criteria, $L_{Aeq,15\ minute}$		
		Day	Evening	Night	Day	Evening	Night
R33 — R38	Lot 89 Church St, Appin[1]	38	37	36	43	42	41

1. *Area is suburban*

7.3.6. Protecting Noise Amenity

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the policy.

By applying Table 2.2 of the NSW EPA's INP for modification to the acceptable noise level to account for existing levels of industrial noise, the amenity criteria are shown in **Table 7.3** below. In this case, the amenity criteria was calculated by subtracting 10dB(A) from the existing ambient noise levels.

Table 7.3 – Amenity Criteria for Receivers R33 – R38, dB(A)

Noise Assessment Locations (Receivers)	Corresponding Noise Monitoring Location	Existing Ambient Noise $L_{Aeq,\ period}$			Amenity Noise Criteria, $L_{Aeq,\ period}$		
		Day	Evening	Night	Day	Evening	Night
R33 — R38	Lot 89 Church St Appin[1]	58	54	48	48	44	38

*1. Area is **suburban***

By comparing the intrusiveness criteria with the amenity criteria, and selecting the strictest criteria for day, evening and night periods the project specific noise levels (noise criteria) are shown in **Table 7.4** below.

Table 7.4 – Operational Site Noise Criteria Summary

Noise Assessment Location (Receivers)	Day	Evening	Night
R33 –R38	43[1]	42[2]	38[2]

Note:

1. *Intrusiveness criteria measured in $L_{Aeq,\ 15\ minute}$*
2. *Amenity criteria measured in $L_{Aeq,\ period}$*

7.3.7. Predicted Noise Levels

Noise emissions from the various plant, processes and operations were calculated to the nearest and potentially most affected residential receiver locations. Furthermore, noise contours have been generated for critical areas under worst-case scenarios to show how noise disperses over a given area. Noise emissions were determined by modelling the noise sources, receiver locations, topographical features of the intervening area and recommended noise control treatments, using the SoundPLAN noise modelling software with the CONCAWE noise algorithms. The computer model calculates the contribution of each noise source at each specified receptor point and allows for the prediction of the total noise from a site. SoundPLAN is used world-wide and its environmental noise predictions, using the CONCAWE algorithms, have been verified by many in the field.

Noise levels were modelled considering typical worst case scenarios, where either most or all plant operate simultaneously, depending on the likelihood of such an occurrence. That is, if it is likely that all plant may be operating concurrently, then all plant were also modelled concurrently. The predicted noise levels assume noise control treatments (in this case noise control kits for mobile plant) are fully implemented.

As a further exercise, the noise levels resulting from adverse meteorological conditions potentially increasing noise emissions at the nearest residences, were computed as per the NSW EPA's requirements.

Noise predictions (and noise contour plots for critical situations) were prepared for each of the following three meteorological scenarios:

1. Acoustically neutral — no wind and no temperature inversion

2. Slight to gentle breeze — 3m/s wind velocity at l0m from ground level between each noise source and each noise receiver (as per INP's default wind conditions where more site specific data is unavailable)

3. Moderate temperature inversion — 3° Celsius per 100m temperature gradient or 'F-Class' Pasquill stability category as entered in SoundPLAN with a 2m/s drainage-flow wind (as per INP's default temperature inversion conditions for non-arid areas where more site specific data is unavailable).

At the critical residential receiver locations potentially affected by this project, adverse weather conditions with a 3m/s wind were found to provide equal to or higher noise levels than under temperature inversions with drainage-flow wind conditions.

Table 7.5 presents the predicted noise levels at each selected noise receiver location and the relevant operational noise criteria (from **Table 7.4**), allowing a direct assessment of noise impact.

Table 7.5 – Stage 3 Noise Modelling Results dB(A)

Noise Assessment Locations (Receivers)	Corresponding Noise Monitoring Location	Predicted Noise Levels dB(A) L^{10}		Operational Noise Criteria L_{Aeq}		
		Neutral	Wind	Day	Evening	Night
R33 – Cataract Scout Park	Lot 89 Church St Appin	32	37	43	42	38
R34– Cataract Scout Park	Lot 89 Church St Appin	31	36	43	42	38
R35– Cataract Scout Park	Lot 89 Church St Appin	31	36	43	42	38
R36– Cataract Scout Park	Lot 89 Church St Appin	31	35	43	42	38
R37- Bushland	Lot 89 Church St Appin	33	37	43	42	38
R38 – Private Lot	Lot 89 Church St Appin	32	36	43	42	38

Figure 7.5 is a noise contour map illustrating the dispersion of noise under adverse meteorological conditions and the location of modelled noise sources and receivers.

As can be seen from the results in **Table 7.5**, noise compliance is achieved at all noise receiver locations even under adverse wind conditions. It should be noted that the predicted noise levels represent an L^{10} level, meaning it is the sound pressure level exceeded for only 10% of the time while the operational noise criteria levels represent an $\mathbf{L}_{Aeq}$ sound pressure level, which equates roughly to a 50 percentile or median within the sound range. This means that in terms of the operational noise criteria, the predicted noise levels are conservative, and if the predicted noise levels were measured as $\mathbf{L}_{Aeq}$, they would be approximately 3dB less than the predicted L^{10} levels shown above.

It should also be noted that the closest residences in Appin township are approximately

1.5km further north than the noise receivers in the noise assessment.

7.3.8. Conclusion

Renzo Tonin and Associates (2001) concluded that noise compliance would continue to be achieved at noise receiver locations for Stages 1,2 and 3 of the West Cliff Emplacement.

Noise generated on the emplacement site is from coal wash haul trucks and earthmoving equipment and the noise impact from these operations is deemed to be minimal as noise is naturally mitigated by the emplacement being located in a valley and at a distance of 1.5 km to 2.5km from the nearest residential development in Appin. This is confirmed by the noise assessment undertaken by Renzo Tonin and Associates and the lack of complaints about noise from the site.

The emplacement will continue to develop down the valley and therefore operations will gradually move closer to the residential fringes of Appin. If in the future, noise emissions from the Stage 3 coal wash emplacement operations were to cause adverse impacts, further investigations will be undertaken and attenuation measures shall be introduced.

For example, if noise impacts are identified in the future, items of plant may be fitted with 'noise control kits' that achieve a minimum noise reduction of 5dB(A). Such plant may include:

- Bulldozers.
- Compactors.
- Trucks.
- Front end loaders.
- Excavators.
- Rockbreakers.
- Mobile Cranes.
- Scrapers.
- Graders.
- Rollers.
- Vibratory Rollers.
- Water carts.
- Backhoes.

Such 'noise control kits' comprise:

- High performance 'residential-grade' exhaust mufflers,
- Additional engine cowling / enclosure lined inside with sound absorbent industrial-grade foam and
- Air intake and discharge silencers / louvers.

The requirement of fitting 'noise control kits' onto the identified plant, shall be confirmed in the EMP if required.

APPENDIX E

GHG ASSESSEMENT, METHODOLOGY & CALCULATIONS

1 METHODOLOGY

All methodology used in this assessment for the estimation of GHG emissions has been in accord with the *National Greenhouse Accounts (NGA) Factors (2008)* document and in accord with sound scientific and engineering principles. The specific methodologies used in each calculation are given in the following sections. To ensure emissions are not underestimated, all calculations are conservative in nature.

1.1 SOURCE DATA

All source data used in this assessment was obtained from stable and reliable sources where possible or estimated based on engineering experience and reasonable assumptions where sound reference data was not available.

The source data and quantities used in the assessment for each calculation are noted or described in the GHG Emission Calculation spreadsheet, which is provided in **Section 2** of this Appendix.

1.2 FUEL (PETROL & DIESEL) CONSUMPTION CALCULATIONS

The methodology used for calculating GHG emissions from combustion of fuels onsite and during transportation was obtained from the NGA Factors (2008). The following formula was used:

GHG emissions (t CO_2-e) = (Q x EF x EC) / 1000 (Equation 1)

Where,

Q is the quantity of fuel consumed expressed by volume (kL or GJ);

EF is the relevant emission factor expressed in kg CO_2-e/GJ, obtained from the *NGA Factors (2008)* document; and

EC is the energy content factor of the fuel type, expressed in GJ/kL (if Q is measured in GJ, EC=1), obtained from NGA Factors (2008).

Both Scope 1 and Scope 3 emissions are associated with combustion of fuels. Scope 1 emissions account for the point source onsite combustion of the fuel (within the organisation) and Scope 3 emissions account for extraction and transportation of the fuel (outside the organisation). The emission factors for each fuel type are different, due to their different energy contents and chemical properties.

1.3 ELECTRICITY CONSUMPTION CALCULATIONS

Emissions from the consumption of purchased electricity were calculated using the following equation (NGA Factors, 2008):

GHG Emission (t CO_2-e) = (Q x EF) / 1000 (Equation 2)

Where,

Q is the amount of electricity consumed in kWh; and

EF is the relevant emission factor in kg CO_2-e/kWh, obtained from NGA Factors (2008) document.

Both Scope 2 and Scope 3 emissions are associated with electricity consumption. Scope 2 emissions account for combustion of fuel in the energy generation process (eg, coal fired power station), and Scope 3 emissions account for the extraction and transportation of that fuel. Emission factors for both Scope 2 and Scope 3 emissions are provided in NGA Factors (2008).

1.4 SCOPE 3 EMISSIONS FROM MANUFACTURE OF CONSTRUCTION MATERIALS

Scope 3 emissions from the manufacture of construction materials can be estimated using the following formula:

GHG Emission (t CO_2-e) = (Q x EF)/1000 (Equation 3)

Where,

Q is the mass of the construction material (in kg)

EF is the relevant emission factor in kg CO_2-e/kg, as identified in NGA Factors (2008) document.

Scope 3 accounts for emissions resulting from the manufacture process, and vary depending on the construction material used.

2 CALCULATIONS

Additional GHG Emission Calculation Summary Table

1. CONSTRUCTION PHASE OF UPGRADE	Scope 1 Emission (t CO_2-e)	Scope 2 Emission (t CO_2-e)	Scope 3 Emission (t CO_2-e)
1.1. Petrol Fuel Consumption from Employee Travel (Scope 1 & Scope 3)	143		10.9
1.2. Diesel Fuel Consumption from Construction Activities (Scope 1 & Scope 3)	139		11.0
1.3. Electricity Consumption (Scope 2 & Scope 3)		1.3	0.3
1.4. Manufacture of Construction Materials (Scope 3)			524
ADDITIONAL EMISSIONS DURING CONSTRUCTION (t CO_2-e/yr)	**282**	**1.3**	**1102**
2. OPERATIONAL PHASE OF UPGRADE	**Scope 1 Emission (t CO_2-e/yr)**	**Scope 2 Emission (t CO2-e/yr)**	**Scope 3 Emission (t CO2-e/yr)**
2.1. Electricity Consumption (Scope 2 & Scope 3)		2.8	0.5
ADDITIONAL EMISSIONS DURING ONGOING OPERATION (t CO_2-e/yr)	**0**	**2.8**	**0.5**

Additional GHG Emission Calculations

1	**CONSTRUCTION PHASE OF UPGRADE**		
1.1	**Petrol Fuel Consumption from Employee Travel (Scope 1 & Scope 3)**		
	Fuel type = "Gasoline (other than for use as fuel in an aircraft)"		
	(refer NGA Factors (2008), p16, Table 4)		
	Total Volume of Fuel Consumed (Q_i)	60	kL
	Energy Content Factor (ECi)	34.2	GJ/kL
	Energy Content	2068	GJ
	Scope 1		
	CO_2 Emission Factor (EF_{ijoxec})	66.7	kg CO_2-e / GJ
	CH_4 Emission Factor (EF_{ijoxec})	0.2	kg CO_2-e / GJ
	N_2O Emission Factor (EF_{ijoxec})	0.2	kg CO_2-e / GJ
	Total Emission Factor (EF_{ijoxec})	67.1	kg CO_2-e / GJ
	Total Scope 1 $CO_{2\text{-}e}$ emissions (E_{ij})	138.8	t CO_2-e
	Scope 3		
	Scope 3 CO_2-e Emission Factor (EF_{ijoxec})	5.3	kg CO_2-e / GJ
	(NGA Factors [2008], page 58,Table 38)		
	Total Scope 3 $CO_{2\text{-}e}$ emissions (E_{ij})	11.0	t CO_2-e
	Overall Onsite Petrol Fuel Combustion GHG Emission (Scope 1 + Scope 3)	**150**	**t $CO_{2\text{-}e}$**

1.2	Diesel Fuel Consumption from Construction Activities (Scope 1 & Scope 3)		
	Fuel type = "Diesel Oil"		
	(refer NGA Factors (2008), p16, Table 4)		
	Total Volume of Fuel Consumed (Q_i)	53	kL
	Energy Content Factor (ECi)	38.6	GJ/kL
	Energy Content	2057	GJ
	Scope 1		
	CO_2 Emission Factor (EF_{ijoxec})	69.2	kg CO_2-e / GJ
	CH_4 Emission Factor (EF_{ijoxec})	0.1	kg CO_2-e / GJ
	N_2O Emission Factor (EF_{ijoxec})	0.2	kg CO_2-e / GJ
	Total Emission Factor (EF_{ijoxec})	69.5	kg CO_2-e / GJ
	Total Scope 1 CO_{2-e} emissions (E_{ij})	143.0	t CO_2-e
	Scope 3		
	Scope 3 CO_2-e Emission Factor (EF_{ijoxec})	5.3	kg CO_2-e / GJ
	(NGA Factors [2008], page 58,Table 38)		
	Total Scope 3 CO_{2-e} emissions (E_{ij})	10.9	t CO_2-e
	Overall Onsite Diesel Fuel Combustion GHG Emission (Scope 1 + Scope 3)	**154**	**t CO_{2-e}**

1.3	Electricity Consumption (Scope 2 & Scope 3)		
	Indicative alllowance for electricity consumption during construction works	1500	kWh
	Emission Calculation:		
	(refer NGA Factors November 2008, p59, Table 39)		
	EF (CO_{2-e}) Scope 2 (Electricity consumed in NSW & ACT)	0.9	kg CO_2-e / kWh
	EF (CO_{2-e}) Scope 3 (Electricity consumed in NSW & ACT)	0.2	kg CO_2-e / kWh
	EF (CO_{2-e}) Scope 2 & 3 (Electricity consumed in NSW & ACT)	1.1	kg CO_2-e / kWh
	Onsite Electricity Consumption GHG Emission (Scope 2)	1.34	t CO_{2-e}
	Onsite Electricity Consumption GHG Emission (Scope 3)	0.26	t CO_{2-e}
	Overall Onsite Electricity Consumption GHG Emission (Scope 2 + 3)	**1.59**	**t CO_{2-e}**

1.4	Manufacture of Construction Materials (Scope 3)		
	Approximate Mass of Steel for use in construction (indicative allowance, incl. 500 t for building material, 500 t for plant)	1300	tonnes
	Emission factor of steel (Page 21, Table 17, NGA January 2008)	0.009	t CO_2-e/t
	Scope 3 Greenhouse gas emissions from manufacture of steel	12	t CO_2-e
	Approximate Mass of Cement for use in construction	2000	tonnes
	Emission factor of concrete (Page 21, Table 17, NGA January 2008)	0.5	t CO_2-e/t
	Greenhouse gas emissions from manufacture of concrete	1068.0	t CO_2-e
	Total emissions from manufacture of construction materials	1079.7	t CO_2-e
1.5	**EMISSION TOTALS for Construction Phase (Scope 1 & Scope 3)**		
	Scope 1	281.78	t $CO_{2\text{-}e}$
	Scope 2	1.34	t $CO_{2\text{-}e}$
	Scope 3	1101.82	t $CO_{2\text{-}e}$
	TOTAL (Scope 1 + Scope 2)	**283.11**	**t $CO_{2\text{-}e}$**
	TOTAL (Scope 1 + Scope 2 + Scope 3)	**1384.94**	**t $CO_{2\text{-}e}$**

2	**OPERATIONAL PHASE OF UPGRADE**		
2.1	**Electricity Consumption (Scope 2 & Scope 3)**		
	Additional Annual Electricity Consumption	3200	kWh / yr
	Emission Calculation:		
	(refer NGA Factors November 2008, p59, Table 39)		
	EF (CO_{2-e}) Scope 2 (Electricity consumed in NSW & ACT)	0.9	kg CO_2-e / kWh
	EF (CO_{2-e}) Scope 3 (Electricity consumed in NSW & ACT)	0.2	kg CO_2-e / kWh
	EF (CO_{2-e}) Scope 2 & 3 (Electricity consumed in NSW & ACT)	1.1	kg CO_2-e / kWh
	Onsite Electricity Consumption GHG Emission (Scope 2)	2.85	t CO_{2-e} / yr
	Onsite Electricity Consumption GHG Emission (Scope 3)	0.54	t CO_{2-e} / yr
	Overall Onsite Electricity Consumption GHG Emission (Scope 2 + 3)	**3.39**	**t CO_{2-e} / yr**
2.2	**EMISSION TOTALS for Operation Phase (Scope 1, 2, & Scope 3)**		
	Scope 1	0.00	t CO_{2-e} / yr
	Scope 2	2.85	t CO_{2-e} / yr
	Scope 3	0.54	t CO_{2-e} / yr
	TOTAL (Scope 1 + Scope 2)	**2.85**	**t CO_{2-e} / yr**
	TOTAL (Scope 1 + Scope 2 + Scope 3)	**3.39**	**t CO_{2-e} / yr**

Fuel Consumption Calculations

1. Fuel Consumption for Worker Travel		
Earthworks/Construction duration	24	months
Number of Workers	30	Workers
No. of travel days (assumes return trip to work each day, 4 wks/month, 5 days/wk)	480	travel days
Total No. of return trips	14400	return trips
Total worker travel distance (assumes avg return trip distance from Wollongong OR Western Sydney of 60kms [30km each way])	864000	km
Total fuel consumed (assumes 7 L/100km, ie, 0.07L/km)	**60**	kL
2. Earthworks (incl. onsite excavators, haul trucks, and miscellaneous machinery)		
Total No. of excavator working days (assumes 1 x 30 tonne excavators used for duration of earthworks)	3	excavator days
Total No. of excavator working hours (assumes 8 hrs/d for duration of earthworks)	24	hours
Total No. of onsite haul truck working days (assumes 1 x haul trucks for duration of earthworks)	3	haul truck days
Total No. of onsite haul truck working hours (assumes 8 hrs/d for duration of earthworks)	24	hours
Diesel consumption for excavators and haul truck (assumes 30L/hr for each machine)	1.44	kL
Additional allowance for miscellaneous machinery (25% of excavator and haul truck fuel)	0.36	kL
Diesel consumption for earthworks	**1.8**	kL
3. Construction Works (allowance for miscellaneous machinery)		
Duration of works	24	months
Total No. of machine working days (assumes 5 d/wk with avg of 1 misc. machine/day)	480	machine days
Total No. of machine working hours (assumes 8 hrs/d for duration of works)	3840	hours
Diesel consumption for construction works (assumes avg 10 L/hr for miscellaneous machinery)	**38**	kL
4. Transportation of Construction Materials for Buildings		
Mass of construction materials	2889	t
Indicative allowance for mass of coal preparation plant/machinery hauled to site (misc. plant/conveyors etc.)	750	t
Effective mass to transport due to packing inefficiency (assumes packing inefficiency factor of 2)	7278	t
No. of trips for 10 tonne truck	728	trips
Total haulage travel distance (assumes haul distance of 60km [avg return distance from Wollongong / Sydney])	43668	km
Diesel consumption for delivery of materials using 10-tonne truck (assumes 30L/100km, ie, 0.3L/km)	**13**	kL
Totals		
Total Petrol Fuel Consumption (Transport)	**60**	kL
Total Diesel Fuel Consumption (Stationary and Transport)	**53**	kL