ILLAWARRA COAL

EXPLORATION PROGRAM

REVIEW OF ENVIRONMENTAL FACTORS

West Cliff Area 5 Borehole Survey Program

RESOURCE & EXPLORATION
ILLAWARRA COAL

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August 2006

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Introduction

BHP Billiton intends to undertake surface exploration activities within West Cliff Area 5. The Survey program will consist of a series of exploration boreholes.

1.1. Locality

West Cliff Area 5 is located approximately two kilometres to the west of the Georges River and west of Appin Road. The survey area is located between Menangle to the northwest and Appin township to the southeast (Figure 1). Previous land management practices within the study area have lead to vegetation clearing and subsequent loss of ecosystem resilience on most of the flat and undulating land that occurs outside of the Georges River.

Infrastructure in the survey area includes Appin Road and other smaller roads. Ownership of land within the survey area includes privately owned allotments.

The proposed exploration area is not within:

- An area reserved or dedicated under the National Parks and Wildlife Act 1974;
- Land reserved or dedicated with the meaning of the Crown Lands Act 1989 for preservation or other environmental protection purposes;
- A World Heritage Area;
- Environmental Protection Zones within environmental planning instruments;
- Lands protected under SEPP 14 – Coastal Wetlands;
- Lands protected under SEPP 26 – Littoral Rainforest;
- Land identified as wilderness under the Wilderness Act 1987 or declared as wilderness under the National Parks and wildlife Act 1974, Aquatic Reserves dedicated under the Fisheries Management Act 1994;
- Wetland Areas dedicated under the Fisheries Management Act 1974;
- Land identified as State Forest under the Forestry Act 1916;
- Western Lands Release; or
- Crown Land.

1.2. Description of the Activity

1.2.1. Overview of Proposed Activity

Boreholes

A series of seven borehole sites within West Cliff Area 5 are proposed. All seven holes occur on land that has been previously cleared and subject to intensive agricultural production. The report considers the following seven boreholes:

- A5-06-BH-A
- A5-06-BH-B;
- A5-06-BH-C;
- A5-06-BH-D;
- A5-06-BH-E;
- A5-06-BH-F:
- A5-06-BH-G

McDermott Drilling contractors have been engaged by BHP Billiton Illawarra Coal to drill the Boreholes. Drilling equipment includes a McDermott's Drill rig and associated equipment including drilling rods, core boxes, generators and fuel tanks. An independent audit of McDermott Drilling has recently been conducted to consider all HSE aspects of its operations. The audit was undertaken at the request of BHP Billiton Illawarra Coal.

Three main stages have been identified for the borehole drilling component of this proposal. These stages are Site Preparation, Drilling Execution and Site Rehabilitation. A discussion of each of these stages is provided below.

Stage 1: Site Preparation

An excavator will be used to prepare a level drilling platform and develop the drill water sumps (4m x 2m x 1.5m). Where an access track departs from an existing farm road, it is anticipated that access across farm paddocks will be possible and the development of access tracks to the proposed drill sites is considered unnecessary at the this stage.

Filter cloth will be installed around all drill sites to prevent any sediment runoff in the event of rain. Further, site fencing will be employed at all sites to prevent unauthorised person access to the site and also to exclude any livestock or native fauna from the site.

Stage 2: Drilling Execution

Drilling at site will be undertaken by state of the art, joystick operated, fully guarded drilling equipment. The drilling equipment will be delivered to the site on a small flat bed truck. At site it will be deployed to its own stand.

The site will be fenced and the equipment will remain on site for the duration of the drilling program at that site.

Daily access to the site will typically involve personnel driving to the site using standard Hilux or Landcruiser 4WD vehicles. Support vehicles such as Gators may also be utilised on site. Gators are small multi (pneumatic) tyred, all terrain vehicles that are capable of traversing softer soils and can also access sites on steep inclines or where a smaller access track may be required.

Delivery of Water to the Site for Drilling Purposes

Water is required on site for the purposes of drilling. As discussed above two sumps are proposed for each drilling site.

Water will be delivered to the drill site by a water carrying truck with a capacity of up to 40 000 litres.

Site Rehabilitation

Rehabilitation of drilling sites and access tracks aims to return the site to original state. Given that all significant vegetation and fauna habitats will be avoided during the site development stage, the reinstatement of the sites will involve the following:

- use of excavator to reinstate larger items to the site and the track such as logs or rocks where necessary.
- Revegetation as necessary.

Site preparation to completion should take no longer than four weeks.

Other Instrumentation

It should be noted that any or all of the borehole sites could potentially be utilised to place instrumentation into the subsurface environment. Such instrumentation may include Peizometers which may be placed in a PVC standpipe above and into the previously drilled borehole. Such instrumentation provides the opportunity to develop a further understanding of the underground environment without further disturbing the lands surface.

Should peizometers remain at any one site beyond the site closure, data loggers will be attached to the instruments and occasional inspections of the sites will be done on foot to download the data. At the completion of the use of the equipment, the instruments will be cut off below the grounds surface, the hole will be sealed to the appropriate standards and the surface rehabilitated to a natural state.

It is proposed that the works would potentially commence in September 2006 with a duration of 12 months.

Photos of the equipment utilised for the borehole drilling program (Plates 1-4) are provided below

1.2.2. Work Location

The borehole sites are located to the southeast of Menangle, north of Appin and to the west of the Georges River.

1.2.3. Activity Duration and Working Times

The exploration activity would over a period of approximately 12 months and is scheduled to take place 5 days per week from 7.00am to 7.00pm although at times, for various reasons activities may be undertaken outside those hours.

It is anticipated that each borehole would be completed within approximately 4-6 weeks of commencement, weather permitting. Access to the boreholes may be maintained as ongoing monitoring of underground conditions is proposed.

All disturbed sites would be rehabilitated upon completion.

1.2.4. Drilling Methods

The drilling methods at each site would involve temporary ground surface disturbance.

Drilling of the holes would be undertaken with a slim hole drilling rig. The type of rig to be used would be typical of rigs used for mineral and petroleum exploration. It would include equipment to raise and lower rods in the well, drive gear for rotary drilling, wire line equipment for recovery of core tubes and down hole devices such as magnets for recovery of and broken bits.

The wells would be drilled utilising water as the circulating fluid. Provision would be made for storage of drilling water for circulation within each hole, primarily to flush cuttings from the hole. This water would be stored in sumps of tanks as described above.

No petroleum based drilling fluids or additives would be used at any stage in the drilling or testing of the wells.

No drilling circulation water would be discharged to waterways.

1.3. Justification of the Activity

The proposed exploration program has been designed to define the underground and seam conditions for mine planning purposes. Exploration is an essential precursor for any mining activity.

1.4. Evaluation of Alternatives

There are no practical alternatives to the proposed exploration program.

2. Planning Context

2.1. Licences and Approval Required

The DPI recognises three categories of exploration activity.

Category 1 Activities Reconnaissance and low intensity activities: do not require a Surface Disturbance Notice – unless activities meet the definitions of Category 2(a) or 2 (b). Category 1 Activities include low intensity activities including:

a) Geological mapping;

b) Airborne surveys;

c) Sampling and coring using hand held equipment;

d) Geophysical surveys and downhole logging, but not seismic surveys;

e) Shallow reconnaissance drilling involving no more than minimal site preparation;

f) Minor clearing or cutting of native vegetation;

g) Minor excavations excluding costeaning or bulk sampling; and

h) Vehicle access that does not require construction of new tracks.

Category 2: Operations which have potential or moderate disturbance to the land surface, native vegetation or other environmental value: Require a surface disturbance notice – unless activities meet the definitions of category 3 (a) or 3 (b). Operations under Category 2 may include:

a) Operations under Category 1 (c) to (h) within or adjacent to Sensitive Areas;

b) Operations under Category 1 (c) to (h) of a concentrated or cumulative nature;

c) Seismic surveys;

d) Excavating or bulk sampling not exceeding 60 cubic metres;

e) Non-intensive drilling involving no more than moderate site preparation, excluding drilling holes exceeding 400 millimetre diameter;

f) Camp construction; and

g) Access tracks, drill pads or line clearing involving no more than moderate native vegetation disturbance.

Category 3: Operations which have the potential to cause significant environmental impact involving for example, considerable land surface disturbance or native vegetation clearing. These activities require a Review of Environmental Factors. Submission of an REF will negate the need for a surface disturbance notice. Such activities may include:

a) Operations under category 2 (c) to (g) within to adjacent to sensitive areas;

b) Operations under catgory 2 (c) to (g) of a concentrated or cumulative nature;

c) Excavations or bulk sampling in excess of 60 cubic metres;

d) Shaft sinking or tunnelling;

e) Drilling holes in excess of 400mm diameter;

f) Intensive drilling, such as for resource definition purposes.

g) Access tracks involving formed construction.

The DPI has advised BHP Billiton Illawarra Coal that the minister for Primary Industries is the determining authority with respect to exploration activities of this nature and will assess the REF under Part 5 of the Environmental Planning and Assessment Act, 1979. DPI-Minerals Resources Division also released a document entitled *Guidelines for*

Review of Environmental Factors in June 2006. This REF has referenced these guidelines.

Legislative requirements for exploration activities in NSW such as the Threatened Species Conservation Act 1995, National Parks and Wildlife Act 1974 and the Federal Environment Protection and Biodiversity Conservation Act 1999 have all been considered during the preparation of this REF.

2.2. Zoning

The area to be explored is Zoned Rural 1a under the Campbelltown Shire Council LEP. The proposed works are not prohibited under this zoning.

2.3. Stakeholder Consultation

Consultation undertaken during the preparation of this REF involved:

- Discussions with the DPI regarding the level of environmental assessment required for the proposed exploration activities.
- Consultation with some landholders to agree upon access and compensation requirements.

3. Existing Environment

3.1. Landform and Geology

3.1.1. Landforms

The exploration area is located on undulating hills and plains that are incised by tributaries of the Nepean and Georges Rivers.

3.1.2. Geology

The soils of the exploration area are derived from the Wiannamata shales. Drilling will be targeting the Illawarra Coal Measures.

3.2. Climate

The climate is warm temperate (warm to hot summers and mild to cool winters).

4. Environmental Impacts and Management

4.1. Air Quality

Vehicle exhaust will be from the drill rig and personnel vehicles. The vehicle exhaust emissions will meet acceptable standards for registered vehicles.

The proposed works will not result in any significant impacts on air quality.

4.2. Water

The proposed activity involves no significant excavation or disturbance. Furthermore, measures are proposed that will minimise any surface soil disturbance. Vehicles will be kept on existing farm roads or within cleared areas.

All vehicles will be parked in a way so as not to damage any vegetation and will not impede the movements of other vehicles along tracks.

Water courses and drains in the vicinity of the sites will remain unaltered and there will be no dirty water runoff generated as a result of the activity during or after the works. Furthermore, appropriate run off control will be placed around the drill sites to prevent any dirty water run off in the event of rain.

There will be no use of chemicals or hazardous materials during the proposed works. The only consumables of concern involve fluids used by the vehicles necessary for the site works, such as diesel, petrol, oil and grease. All of these fluids are contained within the vehicle compartments designed for the purpose and will be inspected to ensure that there are no leaks prior to entry into the area.

As a further precaution bunding with sufficient capacity to completely contain any potential fuel spills will be located on site.

4.2.1. Surface Water

The exploration area is located within the catchment of the Nepean and Georges Rivers.

Sufficient water management activities will be in place to ensure that the exploration activities do not interfere with or degrade the surface water of the local area.

4.2.2. Groundwater

There will be no impact on local groundwater.

4.3. Soils

The soils of the exploration area are predominantly shale derived soils overlying sandstone. These soils are generally suitable for grazing and cultivation.

Drilling will have minimal impact on soils of the local area.

Where larger areas are disturbed, for example if sumps are constructed to contain recirculating water, the topsoil will be pushed up in a small stockpile prior to excavating the sump. On completion of drilling the sump will be empties of water and backfilled with excavated material. The topsoil will then be reintroduced across the former sump footprint. If necessary the site will be sown with groundcover species to prevent soil erosion.

4.4. Noise and Vibration

Potential noise and vibrations associated with the proposed activities may derive from drilling and excavation equipment. These impacts are extremely localised and the implications of these impacts have been fully discussed within all landholders

It should be noted that significant noise is currently generated from the Hume Highway and the Southern Railway. The proposed exploration activities are unlikely to significantly increase these levels.

In the event that any complaints are received in respect to noise, consultation and investigation would be undertaken to assess the nature of the concerns and identify options to mitigate the noise.

4.5. Flora and Fauna

Native vegetation mapping provided by NSW NPWS (2002) shows that two Endangered Ecological Communities occur within West Cliff Area 5 Survey area. The Department of Environment and Conservation (DEC – formerly the National Parks and Wildlife Service) have previously described the native vegetation of the site as being representative of several Endangered Ecological Communities (NPWS 2002) including Shale Sandstone Transition Forest (High and Low Sandstone Influence) and Cumberland Plain Woodland (Shale Plains Woodland sub-unit). These communities are listed as Endangered Ecological Communities on both the *Threatened Species Conservation Act* 1995 and the *Environment Protection and Biodiversity Conservation Act* 1999. Boreholes A5-06-BH-D and E are located in areas mapped as Shale Sandstone Transition Forest (High and Low Sandstone Influence). Based on this vegetation mapping it is our recommendation that any remnant, regrowth or regenerating native vegetation be treated as a vegetation community of conservation significance and avoided by the proposed works.

Further, a desk top assessment undertaken by Biosis Research Pty. Ltd. includes a number of best practice recommendations to ensure that the exploration activities will have no impact on any important flora and fauna. These recommendations will be incorporated into the exploration activities. The Biosis Research Flora and Fauna desk top assessment report is attached.

It should be noted that the desk top assessment prepared by Biosis Research has considered only seven of the proposed boreholes. The general principles and recommendations provided for the seven assessed boreholes can be applied to those proposed holes not formally assessed by Biosis and they will be adhered to.

4.6. Chemical and Hazardous Substance Management

Only limited quantities of hazardous substances will be utilised during the exploration activities. These substances include petrol and diesel fuels. All fuels will be contained.

Drilling activities will be subject to a health and safety plan and Material Safety Data Sheets will be available for any potential hazardous materials used.

Only water will be used as the drilling fluid.

4.7. Contaminated Land

Past land use in the survey area has been confined to agricultural activities. No contaminated lands have been identified within the survey area and given the past land use of the study area it is considered highly unlikely that contaminated lands would exits within the survey area.

Only an unexpected escape of fuels or oils could have potential to cause land contamination. Any such escape would be quickly contained and recovered.

4.8. Waste Minimisation and Management

There will be no vegetation removal for the proposed borehole development activities. Minimal waste is expected to be produced as a result of the drilling program. Any wastes such as paper products, drums etc. if produced would be removed from the work site for proper disposal or recycling.

4.9. Natural Resource Use

Site preparation will involve earthworks for the construction of drill pads, in-ground water management sumps and the preparation of bunds around the drill sites. This disturbance provides the potential for localised increased erosion and sedimentation.

Appropriate sedimentation and erosion controls will be employed at each site, along temporary access tracks and around soil bunds. Appropriate control measures include:

- Minimal ground disturbance;

- Topsoil from excavations or sumps to be stockpiled for use in rehabilitation;
- Upslope drains will divert upslope runoff water around disturbance areas although it should be noted that in general the drill sites will attempt to be located on flat areas rather than on hill sides;
- Sediment fences to be erected around the down slope sides of topsoil stockpiles and disturbance areas; and
- The sites will be rehabilitated immediately after drilling activities have been completed.

4.10. Impact on the Community

4.10.1. Traffic

The project will span a 12 month period and will include the arrival and departure of drilling contractors to the drill sites each day and the delivery of materials. The drilling contractor will have several heavy vehicles including the drilling rig, ancillary vehicles and equipment. These vehicles will mostly remain located at the site until the completion of each hole. The drilling contractor will be required to maintain the vehicles in a roadworthy condition and obtain all necessary approvals and licences for them.

Further, given the rural nature of the survey area, traffic activity in the region is generally low. The proposed activities will not add considerably to the traffic of the survey area.

4.10.2. Socio-economic and Community Aspects

Due to the limited nature of the proposal, no significant socio-economic or community impacts would result from the proposal.

Notwithstanding, there would be a positive short term economic effect associated with the short term employment of drilling employees associated with the proposal and expenditure for accommodation, food and entertainment in the local area.

4.11. Visual Assessment

Due to the short term nature of the proposal, potential visual impacts due to the operation of drill rigs would be limited. Further, given the proposed hours of operation, lighting will not be required at the drill sites.

4.12. Heritage

4.12.1. Aboriginal Heritage

The proposed boreholes have been cited within cleared agricultural lands. These areas have been extensively disturbed by past and continuing agricultural practices.

West Cliff Area 5 has been subject to a number of assessments undertaken by Biosis Research which include a desk top assessment of the proposed borehole sites. The Biosis Research Archaeological desk top assessment report is attached.

A review of the NSW Department of Environment and Conservation (DEC) AHIMS register identified 13 previously recorded Aboriginal archaeological sites within a five by five km area surrounding the study area at Appin. Of these, three recorded sites are located within 200 metres of the site area. As such it has been recommended that a field survey be undertaken to assess the impact on previously recorded and unrecorded sites before the borehole work at West Cliff Area 5 goes ahead. It should be noted that the precise location of the boreholes has not been assessed by Biosis Research or Aboriginal Community Representatives.

Where practicable, site inspections including an archaeologist and representatives of the Aboriginal Community will be undertaken prior to development.

It should be noted that the desk top assessment prepared by Biosis Research has considered only four of the proposed boreholes. The general principles and recommendations provided for the four assessed boreholes can be applied to those proposed holes not formally assessed by Biosis and they will be adhered to.

4.12.2. Other Cultural Heritage

See Section 4.12.1 above.

4.13. Landuse

4.13.1. Stock Injury and Loss

Land use in the survey area includes but is not limited to grazing activities. As such the use of appropriate site fencing will exclude all domestic, agricultural and native fauna from accessing the drill sites and therefore prevent injury to these animals.

Consultation with the landholder how to best minimise disturbance to grazing stock will be undertaken prior to the commencement of any works and will be undertaken at regular intervals throughout the survey program as required by the landholder.

4.14. Cumulative Environmental Impacts

Given the land use history of the proposed borehole sites, cumulative impacts are not considered to be of consequence for the proposed drilling works.

4.15. Summary of Mitigating Measures

Development of the proposed boreholes is considered unlikely to have significant environmental impact. However, the proposed activities have the potential to result in minor, short term and localised impacts including water quality, noise and sediment and erosion. The activities described in Section 4.2, 4.2, 4.3, 4.4 and 4.6 describe how these potential impacts will be managed.

5. Rehabilitation Works

On completion of the proposed exploration activities, all surface infrastructure and waste (such as litter, used materials and any contaminated soil) would be removed from the site. Where earthworks have been conducted, the stockpiled soil would be returned (topsoil and subsoil) and the areas re-contoured to its original or near-original landform.

Sediment and erosion control structures would be left in place until the potential for erosion and sedimentation is sufficiently reduced by site rehabilitation.

6. Summary of Impacts and Conclusions

The proposed drilling program will involve minor disturbance to areas of cleared grazing lands and will be conducted over twelve months. Following completion, production water will be disposed of in accordance with regulatory requirements and all disturbance areas would be rehabilitated to the satisfaction of the DPI. The exploration activities will be conducted in accordance with suitable environmental management procedures and take into account the potential impacts associated with the activity. Accordingly, the proposed drilling activities can be undertaken with minimal impact to the environment.

7. Attachments

8. Plates

Plate 1: Reticulation Sumps shown with filter cloth, bunding and fencing.

Plate 2: Reticulation Pit Showing Pumping System, safety fencing and man-proof fencing.

Plate 3: Universal 1000 drilling rig set up to core coal seams

Plate 4: Site rehabilitated with standpipe and Piezometer recorder .Data is sent by telemetry eliminating need to access site.