# THE WALLERAWANG COLLIERIES LIMITED

## 2010 ANNUAL ENVIRONMENTAL

## MANAGEMENT REPORT

| | | | |
|---|---|---|---|
| **Name of mine** | | Baal Bone Colliery | |
| **Titles/Mining Leases** | | CCL 749, MPL 261, CL 391, ML 1302, ML 1382, ML 1607 | |
| **MOP Commencement Date** | 10/07/2009 | **MOP Completion Date** | 10/07/2016 |
| **AEMR Commencement Date** | 01/01/2010 | **AEMR End Date** | 31/12/2010 |
| **Name of leaseholder** | | The Wallerawang Collieries Limited | |
| **Name of mine operator (if different)** | | Baal Bone Colliery | |
| **Reporting Officer** | | Diana Barnes | |
| **Title** | | Environment and Community Officer | |
| **Signature** | | …… | |
| **Date** | | | |

Managed by xstrata coal

## Table of Contents

# SECTION 1.0: INTRODUCTION

## 1.1 Scope

This Annual Environmental Management Report (AEMR) for Baal Bone Mine is prepared annually by Baal Bone Colliery to fulfil the reporting requirements of various regulatory departments.

The layout of this AEMR has been aligned to the Department of Primary Industries – Mineral Resources' (DPI-MR) document: '*Guidelines and Format for Preparations of an Annual Environmental Management Report'*, Version 3, January 2006.

The report will be submitted to the following Authorities:

- Department of Industry and Investment (DII);
- Department of Planning (DoP);
- NSW Office of Water (NOW);
- Lithgow City Council (LCC);
- Department of Environment, Climate Change and Water (DECCW);
- Sydney Catchment Authority (SCA);
- Forests NSW.

The reporting period for this AEMR is 1st January 2010 to 31st December 2010.

It should be noted that this AEMR does necessarily provide a comprehensive description of each individual operation or environmental control that is currently employed at Baal Bone; this level of detail is available in the Mining Operations Plan (MOP) for Baal Bone's Underground Operations (July 2009).

Rather, this AEMR will focus on providing a succinct review of the significant operational and environmental activities undertaken throughout the year. It will also examine the performance of key site operations and environmental controls throughout the 2010 reporting period.

Included is a summary of monitored data (as applicable), a discussion regarding the level of compliance achieved; together with an overview of initiatives proposed and actions planned for the 2011 reporting period.

## 1.2 Consents, Leases and Licences

### 1.2.1 Current Consents, Leases and Licences

A list of all current consents, leases, licences and approvals are included below in **Table 1.1**.

*Table 1.1. Consents, Leases, Licences and Approvals.*

| Type | Regulatory Authority | Approval Number | Holder | Issue Date | Expiry/Review Date | Scope |
|---|---|---|---|---|---|---|
| **Development consent** | DoP | 09_0178 | The Wallerarang Collieries Pty Ltd. | 14/01/2011 | 31/12/2014 | Part 3a Approval for continued operations at Baal bone Colliery. Will supersede all prior development consents (except for Ventilation Shaft and Transmission line) as previous consents are relinquished over 2011. |
| **Development Consent** | DoP | Nil | Coalex Pty Ltd | 13/09/1982 | Perpetuity (Under model provisions exp. 01.08.10) | Original development consent for Baal Bone Colliery – coal for export. |
| **Environment Protection Licence** | DoP | 164/98 | Coalex Pty Ltd | 31/12/1992 | Perpetuity (Under model provisions exp. 01.08.10) | Section 102 EP&A Act (1979) modification of original Development Consent (13/09/1982) to include road haulage of 150,000 tonnes of coal per annum for industrial purposes |
| | | | The Wallerawang Collieries Ltd | 19/08/1999 | 30/12/2000 | Road haulage of 1.5 million tonnes of coal per annum for domestic market. |
| | DoP Greater Lithgow Council | 164/98 186/95 | The Wallerawang Collieries Ltd The Wallerawang Collieries Ltd | 25/08/2000 | 31/12/2003 | Modification to DA 164/98 for the extension of coal haulage time for 900,000 tonnes of coal on the haulage road from Baal Bone Colliery by public road. |
| | | | | 23/12/2003 | 31/12/2015 | Modification to DA 164/98 for the extension of the duration of the haulage road from Baal Bone Colliery to Mt Piper and Wallerawang Power Stations. |
| | | | | 27/02/1996 | Perpetuity | Development consent for open cut mining and associated development of Boxcut as part of the Northern Extension |

| Type | Regulatory Authority | Approval Number | Holder | Issue Date | Expiry/Review Date | Scope |
|---|---|---|---|---|---|---|
| | DoP | 07_0035 | The Wallerawang Collieries Ltd | 24/10/2007 | Perpetuity | Ventilation Shaft and Power Line Project |
| | DECCW | 765 | The Wallerawang Collieries Ltd | 17/11/2009 | 10/09/2014 | Premises and Scheduled Activity (Coal Mining/ Washery) Licence |
| **Mining Operations Plan** | DII | 09/2520 | The Wallerawang Collieries Ltd | 10/07/2009 | 10/07/2016 | MOP for Baal Bone Colliery LW 29-31. |
| **Mining Leases** | DII | CCL 749 | The Wallerawang Collieries Ltd | 05/04/1990 | 23/03/2021 | Mining Entitlement (Consolidates MPL 209, CL 246, CL 329, CL 330, CL331 and CL332) Various depths |
| **S126(1) Approval** | DII | MPL 261 (Act 1973) | The Wallerawang Collieries Ltd | 22/08/1990 | 22/08/2011 | Mining Entitlement (Southern mine dewatering bores) Parish: Ben Bullen, Depth: Surface - 10m |
| | DII | CL 391 (Act 1973) | The Wallerawang Collieries Ltd | 24/02/1992 | 24/02/2013 | Mining Entitlement Parish: Ben Bullen Depth: > 20m |
| | DII | ML 1302 (Act 1992) | The Wallerawang Collieries Ltd | 29/09/1992 | 29/09/2013 | Mining Entitlement Parish: Ben Bullen Depth: >20m |
| | DII | ML 1389 (Act 1992) | The Wallerawang Collieries Ltd | 09/05/1996 | 09/05/2017 | Mining Entitlement Parish: Ben Bullen Depth: Surface – unlimited Surface - 20m |
| | DII | ML1607 | The Wallerawang Collieries Ltd | 08/01/08 | 08/01/18 | Mining Lease (Purposes) Parish: Cox Depth: Surface – 10m |
| | DII | 317524306001 | Baal Bone Colliery | 14/11/2005 | Perpetuity | Section 126(1) of the CMRA (1982) for the construction and operation REA 5 |
| **S100(1) Approval** | DII | 317551291001 | Baal Bone Colliery | 12/02/08 | Perpetuity | Section 100(1) of the CMH&SA (2002) for the construction and operation of REA 6 |
| **Clause 88(1) Approval** | DII | OUT09/1983 | Baal Bone Colliery | 16/02/2009 | 01/03/2012 | Approval to longwall mine Panels 29 & 30 within the Lithgow seam. |

| Type | Regulatory Authority | Approval Number | Holder | Issue Date | Expiry/Review Date | Scope |
|---|---|---|---|---|---|---|
| **Subsidence Management Plan** | DII | 06/7570 | Baal Bone Colliery | 07/12/2007 | 01/12/2014 | Subsidence Management Plan for Extraction of Longwalls 29-31, Lithgow Seam |
| **Occupation Permit** | Forests NSW | 14719 | Baal Bone Colliery | 05/03/1991 | Perpetuity | Occupation permit relevant to the power line route from the company's freehold land to MPL 261 (Long Wall 1 Mine dewatering bore); includes various subsequent extensions. |
| **S22H (1)(a) Approval** | DLWC | 14161 | Baal Bone Colliery | 08/03/1991 | Perpetuity | Occupation Permit for the powerline that supplies power to the railway loop on the western edge of Ben Bullen State Forest. |
| | | N/A | Baal Bone Colliery | 27/07/1991 | Perpetuity | Section 22H(1)(a) of the Rivers and Foreshores Act (1948) exemption. Permission to undertake activities on streams and drainage lines within the Baal Bone Mining Leases. |
| **Bore Licences** | NOW | 80BL136703 | The Wallerawang Collieries Ltd | 14/01/2008 | 13/01/2013 | Section 115 of the Water Act 1912. Bore – (under UC1 and UC2). Main washery water make-up bore near UC1 |
| | NOW | 80BL135509 | The Wallerawang Collieries Ltd | 09/06/2007 | 08/06/2012 | Section 115 of the Water Act 1912. Borehole No. 6 near Rail Loop; washery make-up and dust suppression. |
| | NOW | 80BL236132 | The Wallerawang Collieries Ltd | 18/01/1995 | Perpetuity | Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 1 (South Bore 1) |
| | NOW | 80BL236134 | The Wallerawang Collieries Ltd | 18/01/1995 | Perpetuity | Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 1 (South Bore 2) |

| Type | Regulatory Authority | Approval Number | Holder | Issue Date | Expiry/Review Date | Scope |
|---|---|---|---|---|---|---|
| | NOW | 80BL239077 | The Wallerawang Collieries Ltd | 19/06/2006 | 18/06/2011 | Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 19. North Bore. |
| | NOW | 10BL601877 | The Wallerawang Collieries Ltd | 08/06/2007 | Perpetuity | BBN175; LW29-31 groundwater monitoring piezo |
| | NOW | 10BL601816 | The Wallerawang Collieries Ltd | 08/06/2007 | Perpetuity | BBN176; LW29-31 groundwater monitoring piezo |
| | NOW | 10BL601817 | The Wallerawang Collieries Ltd | 08/06/2007 | Perpetuity | BBN177; LW29-31 groundwater monitoring piezo |
| | NOW | 10BL601970 | The Wallerawang Collieries Ltd | 05/09/2007 | Perpetuity | BBN 179; LW29-31 groundwater monitoring piezo |
| **Water Licence** | NOW | 80SL046064 | The Wallerawang Collieries Ltd | 17/07/2007 | 17/07/2012 | Section 12 of the Water Act 1912. Diversion works, 2 pumps, overshot and block dams, bywash dam. |
| **Acknowledgement of Dangerous Goods on Premises** | Work Cover Authority | 35/023231 | The Wallerawang Collieries Ltd | 05/04/2009 | 22/07/2011 | Dangerous Goods Licence. |
| **Radiation Gauge** | DECCW | 29207 | The Wallerawang Collieries Ltd | 20/12/2007 | 16/01/11 | To sell and posses – Radiation Control Act 1990. Coal quality sensing device |
| | DECCW | 1123 | The Wallerawang Collieries Ltd | 16/09/2009 | 15/09/2011 | Registration Certificate – Radiation Control Act 1990; fixed radiation gauge. |

Abbreviations:

CCL – Consolidated Coal Lease
CL – Coal Lease
CMRA – Coal Mines Regulation Act 1982
DA – Development Application
DECCW – Department of Environment, Climate Change & Water
DoP – Department of Planning
DII – Department of Industries & Investment
EPL – Environment Protection Licence
ML – Mining Lease
MOP – Mining Operations Plan
MPL – Mining Purposes Lease
NOW – NSW Office of Water
REA - Refuse Emplacement Area

### 1.2.2 Amendments During the Reporting Period

Baal Bone's Mining Operations Plan (MOP) was reviewed during early 2009 due to its pending expiration, with a fresh document prepared and lodged with DPI-MR on 5 June 2009. This document was approved on 3rd July 2009.

An amendment to this MOP was lodged by Baal Bone on 23 March 2010, to include a small set of exploration headings to be driven in a limited area extending from the existing adits on the

northern highwall of the Box Cut. The purpose of this was to enable Baal Bone to assess mining conditions and coal quality, and to confirm development rate assumptions and the presence of geological structures. This work was to be completed to assist with planning of the proposed Longwall 32.

This MOP Amendment was approved by I&I 9th June 2010. Work commenced on 5th July and was prematurely concluded on 7th September when the planning for Longwall 32 was cancelled.

The primary consent issued for Baal Bone in 1982 was issued under Part 4 the EP&A Act. Current mining activities at Baal Bone are taking place within Longwalls 29 to 31 which have been authorised by approval under Part 5 of the EP&A Act. *State Environmental Planning Policy (Major Development) 2005* (SEPP 2005) includes transitional provisions, under which the Part 5 approved activities cease to be of effect from 1 August 2010.

As existing longwall operations are not scheduled for completion until 2011 or beyond, Baal Bone is proposing to continue existing mining operations beyond the expiration of its Part 5 approval. Therefore, a fresh Project Approval under Part 3A of the EP&A Act was sought to allow continuation of mining operations at Baal Bone.

AECOM Australia Pty Ltd was engaged by Baal Bone to prepare an Environmental Assessment (EA) to assess potential impacts associated with "the Project". This EA was prepared in accordance with the provisions of Part 3A of the EP&A Act, together with the Environmental Assessment Requirements (DGRs) issued by the Director General of the Department of Planning on the 28 October 2009.

The project application and EA documentation was lodged with Dept. Planning on 8th March 2010. Following due process, the project finally received Ministerial Approval on 14 January 2011.

## 1.3 Mine Contacts

Baal Bone Colliery can be contacted via telephone on (02) 6350 6900 and fax (02) 6359 0530. The postal and street addresses are as follows:

Postal: Baal Bone Colliery
PO Box 13, Lithgow NSW 2790

Street: Baal Bone Colliery
Off Castlereagh Highway
Cullen Bullen, NSW 2790

Personnel responsible for environmental issues at Baal Bone Colliery are shown in **Table 1.2**. The current organisation chart is shown in **Figure 1.1**.

*Table 1.2. Mine Personnel Contact Details*

| Contact Person | Position | Contact Details |
|---|---|---|
| Lawrie Ireland | Operations Manager | Ph: (02) 6350 6928<br>Email: lireland@xstratacoal.com.au<br>Fax: (02) 6359 0596 |
| Gary Linford | Technical Services Manager | Ph: (02) 6350 6945<br>Email: glinford@xstratacoal.com.au<br>Fax: (02) 6359 0530 |
| Diana Barnes | Environment and Community Co-ordinator | Ph: (02) 6350 6920<br>Email: dmbarnes@xstratacoal.com.au<br>Fax: (02) 6359 0530 |

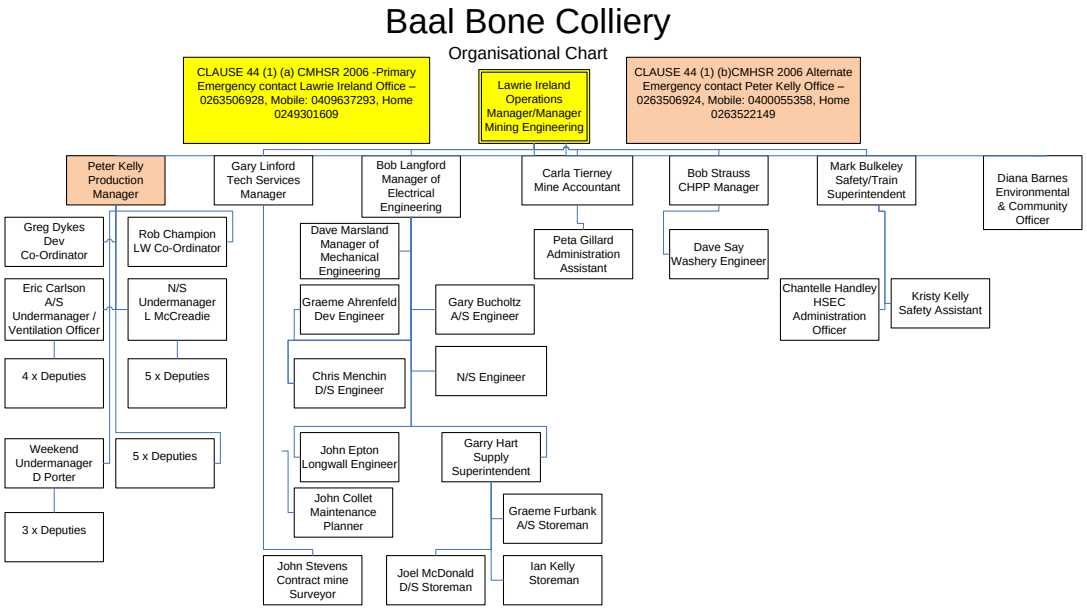



**Figure 1.1. Baal Bone Organisational Chart**

## 1.4 Actions Required at Previous AEMR Review and Site Inspection

The Dept. Industry and Investment (Minerals), Dept. Environment, Climate Change and Water, NSW Office of Water, State Forests and Lithgow City Council representatives attended a Joint Agency AEMR review meeting and site inspection at Baal Bone Colliery on 7th April 2010.

The purpose of the meeting was to review progress of site operations and to discuss issues relating to environmental management and performance for the 2009 AEMR reporting period. Baal Bone's AEMR was formally accepted by I&I in a letter dated 16 April 2010. There were no actions arising from the review.

## 1.5 Employment Status and Demographics

Employment details for staff based at Baal Bone Colliery are found in **Tables 1.3 – 1.5** below:

*Table 1.3 Employment Type*

| Employment Type | Number of persons in reporting period |
|---|---|
| Permanent | 136 |
| Contractor | 30 |

*Table 1.4 Male/Female Breakdown of Workforce*

| Gender | Number of persons in reporting period |
|---|---|
| Male | 132 |
| Female | 4 |

*Table 1.5 Residential Location of Employees*

| Residential Location | Number of persons in reporting period |
|---|---|
| Lithgow Shire | 120 |
| Bathurst | 8 |
| Blue Mountains | 6 |
| Mudgee | 28 |

## 1.6 Environmental and Community Vision and Policy

Baal Bone Colliery has developed an Environment and Community Vision and Policy. These policies have the commitment and support of Baal Bone Management and have been developed with the Xstrata Coal NSW (XCN) Environment and Community Vision and Policy. They are displayed in prominent locations accessed by the workforce, contractors and visitors, as well as being provided on the intranet for all staff awareness. The Environment and Community vision and policy confirms Baal Bone's commitment to being recognised leaders in environmental management and valued operators within the community.

## 1.7 Enduring Value – The Australian Mineral Industry Framework for Sustainable Development

Xstrata Coal is a signatory to "Enduring Value – The Australian Minerals Industry Framework for Sustainable Development". As Baal Bone Colliery is owned and managed by Xstrata Coal Pty Ltd. (Xstrata Coal), it is obliged to operate within the guidelines for environmental management as part of Enduring Value.

## 1.8 National Pollution Inventory

In December 1997, the NSW Parliament passed a number of new legislation that saw the start of the National Pollution Inventory (NPI) reporting process. The NPI is an internet database designed to provide the community, industry and the government with information on the types and amounts of certain substances being emitted to the environment.

In early October, Baal Bone Colliery submitted an NPI report for the period of 1st July 2009 to 30th June 2010. The report detailed emissions of listed substances from Baal Bone Colliery to air, water and land requiring collation, analysis and interpretation of site-specific data. Results can be obtained from the NPI website www.npi.gov.au.

# SECTION 2.0: OPERATIONS DURING THE REPORTING PERIOD

## 2.1 Exploration

There was no exploration activity conducted during the reporting period.

## 2.2 Land Preparation

No land clearing, vegetation removal or soil removing activities were undertaken during the reporting period.

## 2.3 Construction

The existing administration, amenities, workshops and coal handling infrastructure associated with the Baal Bone Colliery should remain unchanged for the remaining life of mine. Consequently there were no construction activities undertaken during the reporting period. Surface facilities and infrastructure are shown on **PLAN 1**.

## 2.4 Mining

### 2.4.1 Longwall Mining

Underground operations continue to extract coal using longwall mining methods from the Lithgow seam.

Extraction of the LW29-31 south-east extension commenced in April 2009 and is scheduled to be completed by Q3 2011 (**PLAN** 2).

### 2.4.2 Open Cut Mining

Open cut extraction of coal at Baal Bone was completed in July 2007.

**PLAN 1** & **PLAN 2** shows the current mine layout and lease areas for both the open cut rehabilitation areas, reject emplacement areas, underground operations and associated surface facilities.

### 2.4.3 Production

The total Run of Mine (ROM) production for the 2010 reporting period was approximately 1.942 million tonnes. The principle export markets for the product in 2010 were Japan and Taiwan. **Table 2.1** shows the production record for 2006-2010 at Baal Bone Colliery.

*Table 2.1 Production Record (2006 -2009) for Baal Bone Colliery (1000 tonnes)*

| Product | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Domestic | 629 | 0 | 0 | 0 | 0 |
| PCI | 159 | 147 | 30 | 0 | 0 |
| Premium | - | - | - | - | 0 |
| Thermal | 1770 | 1410 | 1211 | 1413 | 1277 |
| Total Saleable | 2558* | 1557 | 1241 | 1413 | 1277 |
| ROM Production | 1,840 (UG)<br>648 (OC) | 1,614 (UG)<br>411 (OC) | 1,683 (UG) | 2,140 (UG) | 1,942 (UG) |

* total coal sold in 2006 exceeds ROM production due to a significant stockpile carry over from 2005

### 2.4.4 Resource Utilisation

Mining at Baal Bone Colliery targets the Lithgow Seam of the Illawarra Measures. This is the only seam in the area of sufficient thickness and quality to warrant economic recovery. Other seams in the Baal Bone area do not justify mining operations.

The Lithgow Seam in the open cut area ranged in thickness from 1.9-2.7m and was mainly of dull, medium volatile and generally non-swelling bituminous coal of moderate ash content (average 19.4%) and low sulphur content (0.6%) (Corkery & Co., 1995). The overburden to coal ratio averaged 6 BCM/t.

The Lithgow Seam in the underground workings ranges from 2.25-2.5m in thickness and the full seam height is extracted.

### 2.4.5 Changes in Mining Equipment or Method

Mining method remains the same as the previous reporting period. The major mining equipment fleet utilised at Baal Bone during 2010 is outlined in **Tables 2.2a** and **b** below.

*Table 2.2a. Washery Equipment*

| Equipment Type | Number of Units |
|---|---|
| Caterpillar Dump Truck (773) | 1 |
| Dozers (Michigan W 380, CAT D11) | 2 |
| Caterpillar Front End Loader (966F) | 1 |
| Bobcat Skid Steer Loader (753) | 1 |
| Washery Water Cart | 1 |
| Toyota Landcruiser Utility | 1 |
| Gradall Forklift | 1 |

*Table 2.2b Underground Mining Equipment*

| Equipment Type | Number of Units |
|---|---|
| Bobcat Skid Steer Loader | 1 |
| 913 Eimco | 4 |
| 912 Eimco | 1 |
| 915 Eimco | 1 |
| 130 Eimco | 2 |
| Forklift | 2 |
| Domino Road Grader | 1 |
| PJB Man transports | 8 |

## 2.5 Mineral Processing

Baal Bone produces three grades of washed coal, principally for the export market; these being 9%, 14% & 18% ash coal.

During the 2010 reporting period 1.942Mt ROM underground coal was washed at a nominal rate of 442 tonnes per hour, compared with 1.994 Mt washed during the 2009 reporting period.

There have been no changes or additions to the process or facilities during the reporting period.

### 2.5.1 Production, Processing and Waste Summary

**Table 2.3** shows production and waste for the reporting period plus an estimate for the 2011 reporting period.

*Table 2.3 Production, Processing and Waste Summary*

| | Cumulative Production | | | |
|---|---|---|---|---|
| | **Start of Reporting Period** | 2010 Total (non cumulative) | **End of Reporting Period** | **End of next reporting period (estimated)** |
| Topsoil (freedig) stripped (**m$^3$**) | 1,020,092 | nil | 1,020,092 | 1,020,092 |
| Topsoil (freedig) used/spread (**m$^3$**) | 461,540 | nil | 461,540 | 491,540 |
| Waste Rock (open cut) (**m$^3$**) | 5,810,526 | nil | 5,810,526 | 5,810,526 |
| ROM coal (**1000 tonnes**) | 57,774 | 1942 | 59716 | 61390 |
| Processing Waste (CHPP) (**1000 tonnes**) | 12,950 | 1878 | 14828 | 16723 |
| Product (**1000 tonnes**) | 44,621 | 1277 | 45898 | 47180 |

### 2.5.2 Product Destination and Transportation

During the reporting period there were no changes to the product transportation process. Product destination and tonnages for 2010 has been summarised in **Table 2.4** below.

The total quantity of coal dispatched from Baal Bone during the reporting period was transported by rail to Port Kembla for export. However, Baal Bone also holds a Development Consent to transport up to 900,000 tonnes per annum by public road to the Mount Piper and Wallerawang Power Stations.

Coal haulage by road to Mount Piper Power Station under the most recent Delta contract was ceased in January 2007. Due to the current price of export coal, and the relatively weak prices for domestic thermal coal, it is not envisaged that coal delivery to the power stations will recommence in the short to medium term.

*Table 2.4 Product destination and tonnages for 2010*

| Destination | Tonnes dispatched (2009) | Mode of transportation |
|---|---|---|
| Export – Port Kembla | 1,220,837 | Rail |

## 2.6 Waste Management

### 2.6.1 Washery Waste

Baal Bone Colliery reject comprises a mixture of high ash coal and non-coal materials, such as sedimentary rock and clay. These materials occur both within the coal seam and as floor or roof materials extracted during the mining operation. They are rejected during the beneficiation process on a specific gravity basis.

### 2.6.2 Coarse Reject

Baal Bone's coarse reject has a particle size ranging from 100 mm to 100 micron and comprises approximately 22% of Washery feed. Analysis of the Baal Bone coarse reject material confirms that it is non saline and pH is near neutral with negligible acid producing capacity. It does however exhibit poor physical characteristics with a coarse texture and low water holding capacity.

Even though it is chemically benign, this material is not suitable for use as a growth medium. All reshaped areas are therefore covered with a minimum of 300mm of soil (freedig) material to provide a covering layer in which a sustainable and protective vegetative cover will be established.

During the reporting period 462540 t of coarse reject material was strategically placed around in and around the southern open cut void to eventually create the design final landform. Three dimensional modelling completed in late 2006 indicates that at the end of the 2010 reporting period, approximately 3.037Mt of coarse reject can still be placed in this area. Based on current production rates this area should provide sufficient capacity for the remainder of the life of mine.

### 2.6.3 Fine Reject

Fine Washery reject is generally smaller than 100 micron in diameter and comprises around 7% of Washery feed. Fine reject is pumped as 20–25 % w/w slurry to the designated tailings emplacement area contained within the southern open cut void.

Baal Bone Colliery has previously disposed of fine rejects in Reject Emplacement Area 5 (REA 5) which was decommissioned in August 2008. Reject Emplacement Area 6 (REA 6) received a Section 100 (CMH&S Act) approval in on 12.02.08. Pumping of tailings into REA 6 commenced in August 2008.

REA 6 utilises the void of the southern open cut workings and has a total volume of approximately 454,000$m^3$ in its two cells. During the reporting period 133,693 $m^3$ of tailings was pumped to REA 6. Based on expected average delivery rates this area will have an adequate capacity for fine material emplacement up until closure of mining activities in 2012.

Leachate generated by REA 6 is initially collected in an adjacent leachate collection dam and also later through seepage into the Box Cut sump. It is then returned to the process water circuit for reuse by the CHPP.

### 2.6.4 Open Cut Waste Rock

Open cut mining has ceased at Baal Bone, accordingly there was no open cut waste rock placed during the reporting period.

## 2.7 Ore and Product Stockpiles

The maximum working capacity of the Baal Bone coal stockpiles (both ROM and product) is approximately 1,000,000 tonnes.

During December 2010 the maximum tonnage of stockpiled underground ROM coal reached 220592 tonnes and the maximum tonnage of stockpiled washed coal peaked at 107500 tonnes in December.

## 2.8 Water Management

### 2.8.1 Process Water Circuit

Baal Bone Colliery has a cyclic Process Water Management System. That is, all site runoff is directed into and is reticulated around the Process Water Circuit for use in general site operations and the CHPP. Some water is discharged into the Jews Creek through an EPL licenced discharge point. Approximately 713924 KL of water was discharged through this discharge point during the 2010 reporting period.

As at 31st December 2010, approximately 99 ML of water was held within the process water circuit, see **Table 2.5**. This water is used throughout the CHPP at a rate of 2.5 ML/day.

Tailings slurry from the CHPP is pumped to the tailings dam at an average rate of 150 $m^3$/hr. From the tailings dam, water is gravity fed through a filter embankment to the leachate collection dam, from where it can be pumped back into the Dirty Water Dam. Some leachate is also returned via seepage into the Box Cut sump. Approximately 122.46 ML of leachate water was recycled from the Leachate Dam and/or Box Cut sump into the process water circuit in 2010.

Water from the Dirty Water Dam is subsequently pumped into the Process Water Dam prior to redistribution to the CHPP and to the underground operations for wash down, dust suppression and fire fighting purposes.

### 2.8.2 Potable Water

Potable water is purchased from State Water and is supplied through a connection into the Fish River Water Supply Pipeline. This connection services the administration centres and bathhouses, and is also used underground in a solcenic emulsion for the longwall hydraulic roof support system. Drinking water is also taken underground in containers.

Potable water usage for the reporting period was 22.782ML. As a result of various water savings initiatives during 2009 and 2010, consumption of potable water on site has been further

reduced by 6.125 ML compared to the 2008 reporting period. A total potable water reduction of 23.998 ML has been achieved over the past four years at Baal Bone.

*Table 2.5 Stored Water at Baal Bone Colliery*

| | Volume Held | | | |
|---|---|---|---|---|
| | **Start of Reporting Period** | **End of Reporting Period** | **Volume lost/gained** | **Maximum Storage Capacity** |
| **Dirty Water Dam** | 37 ML | 37 ML | Remained even | 37 ML |
| **Process Water Dam** | 55 ML | 55 ML | Remained even | 55 ML |
| **Box Cut Sump** | 6.9 ML | 6.9 ML | Remained even | 6.9 ML |
| **Controlled Discharge Water (Salinity Trading Schemes)** | Nil | Nil | Nil | Nil |
| **Contaminated Water** | Nil | Nil | Nil | Nil |

### 2.8.3 Sewage Treatment and Disposal

Sewage and grey water effluent from site facilities, including the administration building, bathhouse, CHPP and amenities are collected in a sump and directed through macerator pumps to an on-site sewage treatment plant (STP). The waste is treated by an activated sludge treatment process then is discharged into two maturation ponds, with a total residence time of approximately 20 days.

Following treatment and maturation the overflow from the second pond discharges onto a well vegetated transpiration bed; this is an EPL Discharge and Monitoring Point. The location of the STP and maturation ponds is shown on **PLAN 1**.

Contra-Shear Technology completed a formal operational review of this system in January 2008.

### 2.8.4 Changes to the Water Management System During 2010

There were no changes to the water management system at Baal Bone during the 2010 reporting period.

## 2.9 Hazardous Material Management

### 2.9.1 Status of Licence

Baal Bone holds an *Acknowledgement of Notification of Dangerous Goods on Premises* (35/023231). In order to be granted a licence to store explosives, in accordance with the Explosives Regulation (2005), Baal Bone has nominated suitable persons to hold an Unsupervised Handling Licence following appropriate state and federal security background check. Accordingly the Explosive and Detonator Magazine was also included in the Acknowledgement.

Details of hazardous materials stored on-site during the reporting period are provided in **Table 2.6.** Location of the storage of hazardous goods can be found on **PLAN 1**.

*Table 2.6 Hazardous Materials Stored On Site*

| Hazardous Material | Dangerous Goods Classification | Maximum Quantity Stored | Storage Type |
|---|---|---|---|
| Explosives; blasting, Type A | Class 1.1D | 480 kg | Surface Explosive Magazine |
| Detonator, non-electric and electric | Class 1.1B | 1000 kg | Surface Explosives Magazine |
| Petroleum gases, liquefied | Class 2.1 | 45,500 L | Above Ground Tanks (Pit-top and CHPP) |
| Diesel | Class C1 | 50,000 L | UST (Pit-top) |
| Diesel | Class C1 | 47,000 L | AST (CHPP) |

### 2.9.2 Material Safety Data Sheets

Under Baal Bone Colliery's Environmental Management System (EMS) there is a Hazardous Substance Standard (HSEC STD 5.03 – Hazardous Substances), which deals with the safe storage, handling and disposal of chemicals and other hazardous substances. Materials Safety Data Sheets (MSDS) are made available to all employees at the Store facility.

The Colliery also has a comprehensive online "Chemalert" database, which provides all employees easy assess to information on all chemicals held on site. Information includes but is not limited to: the safe handling of products, Personal Protective Equipment (PPE) requirements, storage, use and disposal of the materials and spill response procedures. Chemalert is available on most PCs including the one for general employee use in the lamp room.

### 2.9.3 Hazardous Materials Audit and Risk Assessment

A Hazardous materials audit and risk assessment was undertaken in 2010 by AECOM as a requirement following notification of DECCW under "Duty to Report Contamination under the Contaminated Land Management Act 1997".

The Hazardous Materials Audit and risk assessment found a number of minor non compliances, mainly due to the factor in consideration not being ALARP or As Low As Reasonably Practicable. Most of these minor non compliances were within the Coal Handling Preparation Plant.
A review of the mine documentation, required as part of the NSW Occupational Health and Safety (Dangerous Goods Amendment) Regulation -2005 and the documents required under the Xstrata standard (HSEC Std3.08), indicated that all documents complied with the regulations and standard.

## 2.10 Other Infrastructure Management

The location of existing infrastructure is shown on **PLAN 1**. During the 2010 reporting period there were no changes or additions to processes or infrastructure facilities.

# SECTION 3.0: ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Baal Bone Colliery maintains and operates an Environmental Management System (EMS), which has been prepared to reflect industry best practice and to specifically address Development Consent conditions, approvals, licence and other statutory requirements. Baal Bone's EMS also includes the LW29-31 Subsidence Management Plan (SMP).

Detailed Plans of Management and Performance Standards for a wide range of environmental elements have subsequently been developed. These Plans and Standards detail relevant control measures, management strategies, monitoring requirements, reporting procedures and performance expectations/criteria.

SP Solutions Pty Limited conducts annual Broad Brush Risk Assessments (BBRA) at Baal Bone, with the 2010 review completed in October. Being a Broad Brush Risk Assessment this review tends to focus on high level health, safety, environmental and community issues.

In conjunction with a wide ranging EMS review completed during 2010, Baal Bone also commissioned a full review of the Environment and Community Risk Assessment (ECRA); this was conducted by **ngh** environmental in July 2010. It should be noted that Mr David Speirs also attended the risk assessment workshop and represented the Baal Bone Community Consultative Committee.

This process enabled a more comprehensive range of risks to be assessed and facilitated development of an updated Aspects and Impacts Register for Baal Bone. All management plans and operating procedures were reviewed accordingly and updated as required; several new documents were also developed so as to better manage identified risks / deficiencies.

It should be noted that this Section of the AEMR does necessarily provide a comprehensive description of each individual environmental control mechanism that is currently employed at Baal Bone; this level of detail is available in the Mining Operations Plan (MOP) for Baal Bone's Underground Operations (July 2009).

Rather, this Section will focus on providing a succinct review of the performance and/or modification of key control measures throughout the 2010 reporting period. Also included is a review of significant activities undertaken or actions completed throughout the year, a summary of monitored data (as applicable), a discussion regarding the level of compliance achieved; together with an overview of initiatives proposed and actions planned for the 2011 reporting period.

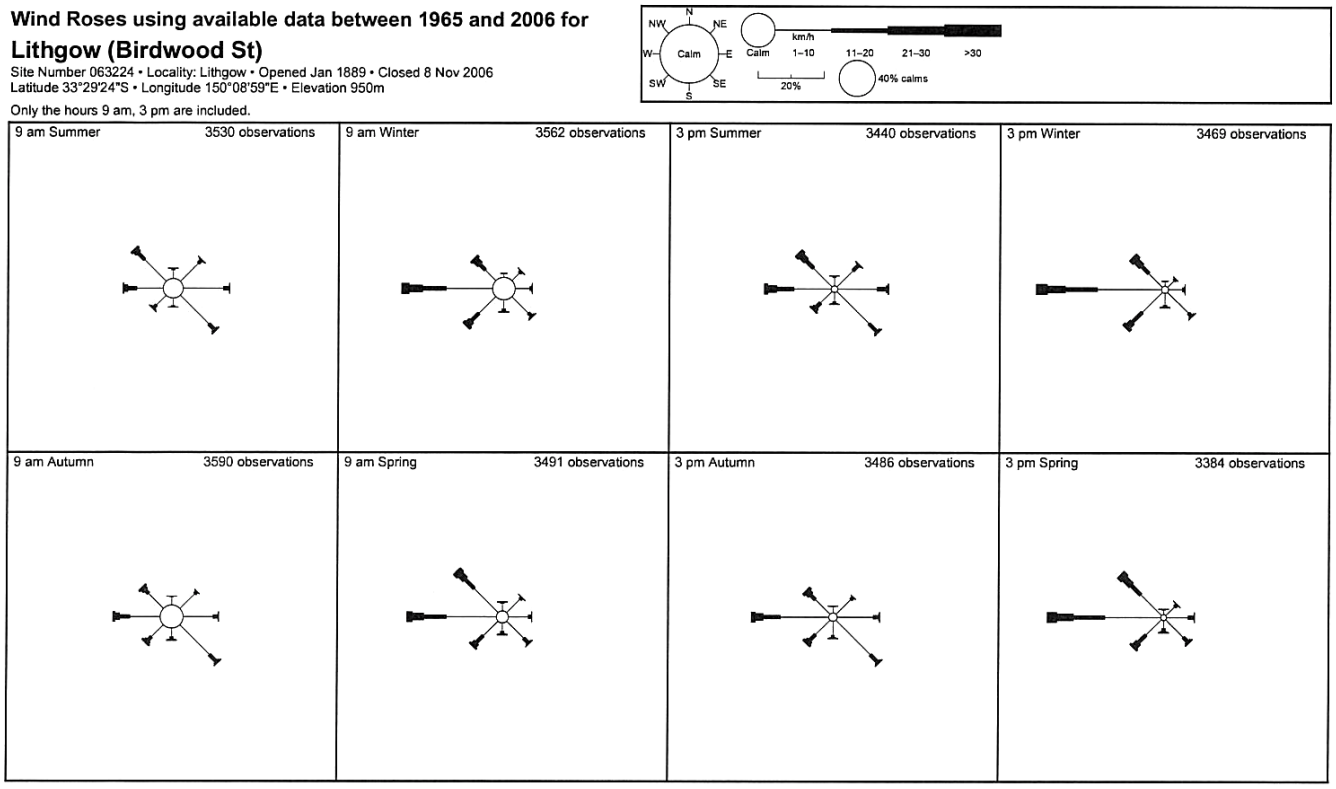
## 3.1 Air Pollution

### 3.1.1 Wind Speed and Direction

The Ben Bullen Range (and State Forest) provides reasonable shelter from winds with the exception of those from the north-west which have a clear fetch of approximately 12km upwind

of the site. However, strong winds from the southwest and southeast may funnel through the gaps in the Ben Bullen Range and along the valleys.

Wind speed and direction at Baal Bone is comparable to the wind conditions from the Lithgow (Birdwood Street) Weather Station. Historic seasonal wind roses for this weather station are found in **Figure 3.1**.






Page 1 of 1

**Figure 3.1 Historic Wind Roses for the Lithgow Weather Station (Birdwood Street)**

### 3.1.2 Dust Monitoring and Sample Locations

Monthly dust fall-out monitoring is carried out in accordance with Australian Standard AS3580.10.1 and EPL requirements. Baal Bone has engaged Ecowise Environmental Pty Limited, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis.

Baal Bone maintains a network of 4 dust deposition gauges to monitor dust levels around site and in the vicinity of our nearest neighbour, these are:

- Sample Location DM1 (EPL Monitoring Point No. 7)
- Sample Location DM2 (EPL Monitoring Point No. 8)
- Sample Location DM3 (EPL Monitoring Point No. 9)
- Sample Location DM4 (EPL Monitoring Point No. 10)

Location of these gauges are illustrated on **Drawing 1**.

### 3.1.2 Modifications to the Dust Monitoring Network

There has been no change to any location of Ball Bone Colliery's dust fallout monitoring network during the reporting period.

### 3.1.3 Review and Interpretation of Dust Monitoring Results

Levels of *Total Solid Particles* were monitored in accordance with EPL 765 and the DECC Guideline of 4.0g/m$^2$/month has been adopted as a reasonable maximum level. Results of dust fallout monitoring conducted during the 2010 reporting period are illustrated graphically in **Figures 3.2 – 3.5** below.

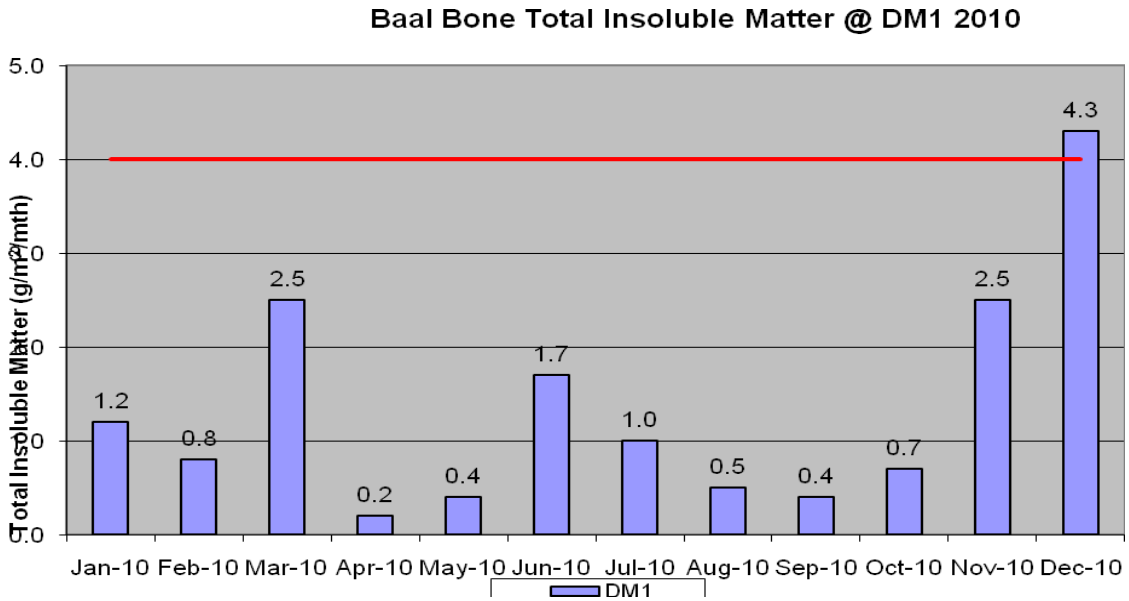



**Figure 3.2. Monthly dust deposition results for Sample Location DM1**

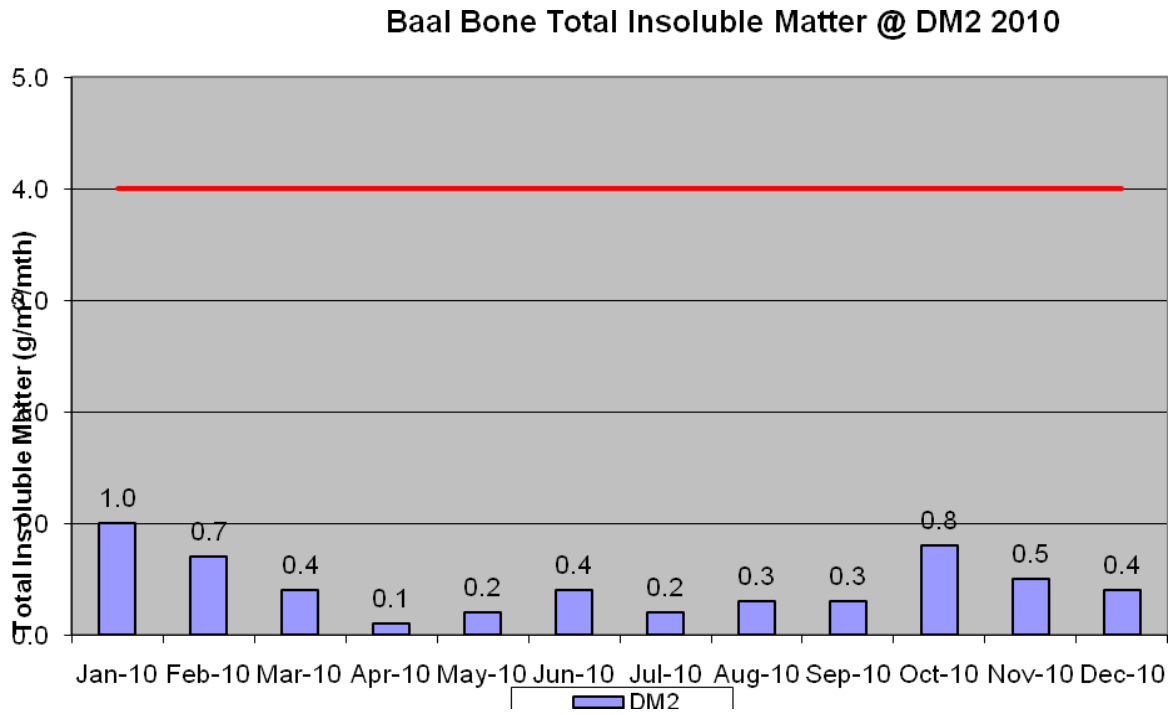



**Figure 3.3. Monthly dust deposition results for Sample Location DM2**

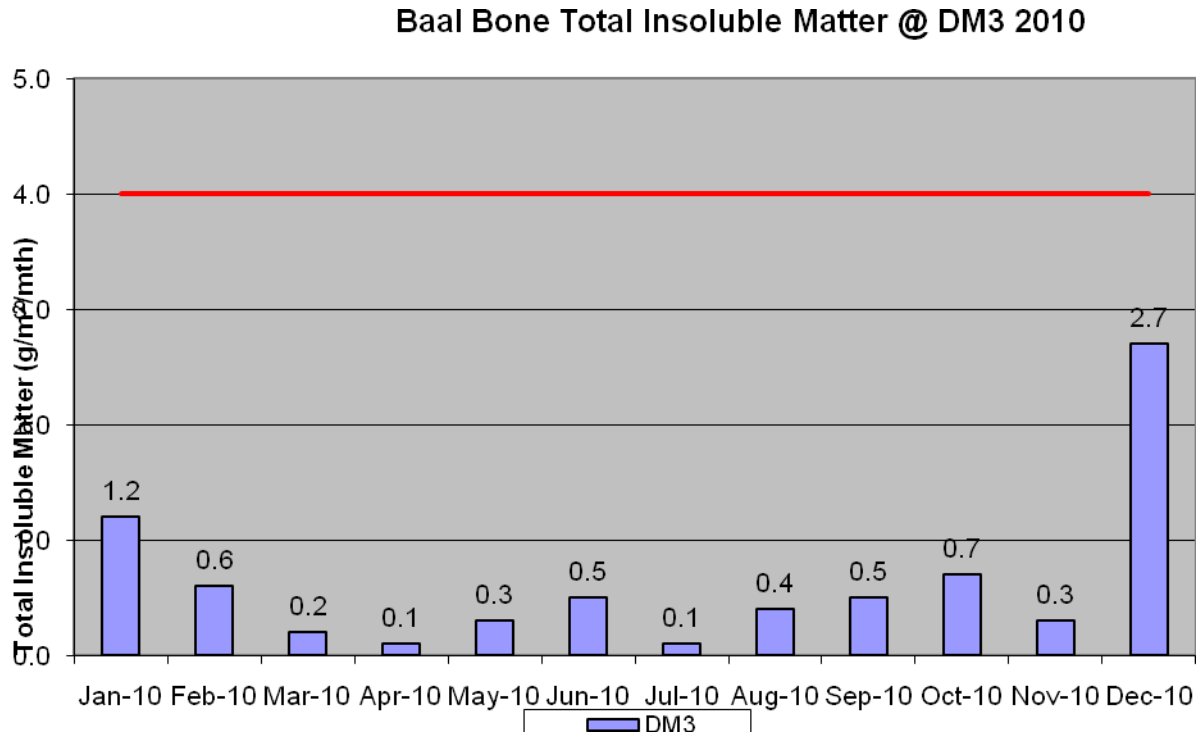



**Figure 3.4. Monthly dust deposition results for Sample Location DM3**

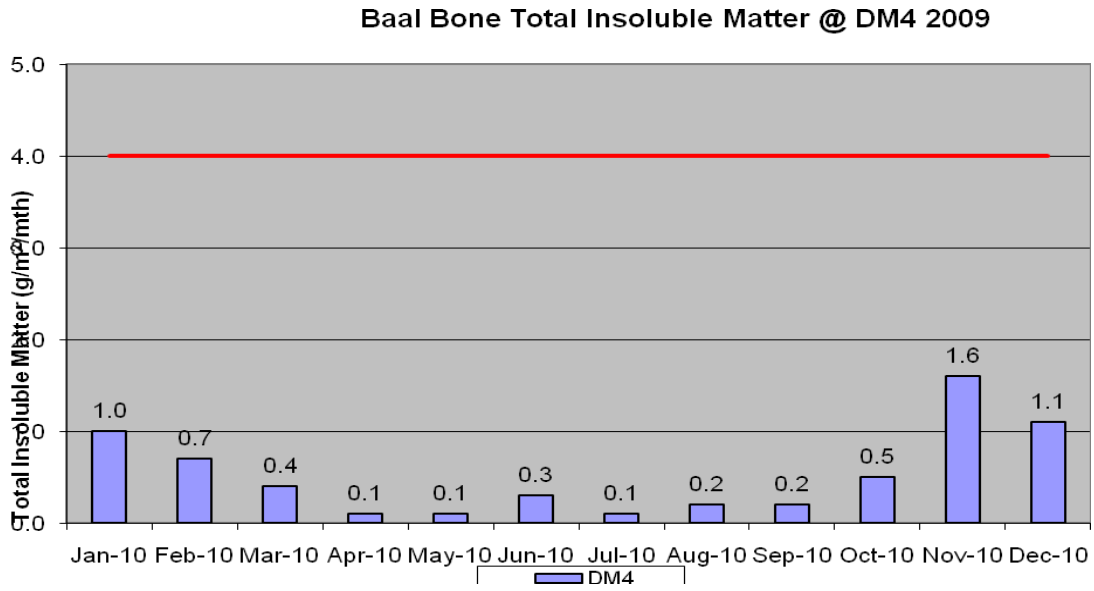



**Figure 3.5. Monthly dust deposition results for Sample Location DM4**

All four dust deposition gauges were sampled monthly during the reporting period. With the notable exception of the following, all remaining monthly concentrations of *Total Solid Particles* were well below the DECCW Guideline with an average of less than 4.0g/m$^2$/month:

- December reading for DM 1

Field sheets supplied by the sampling contractor do not indicate any particular issues, and the result is only marginally above the DECCW guideline. There were no dust related complaints received by Baal Bone during 2010.

## 3.2 Erosion and Sediment Control

In non-active areas of the mining lease, there have been negligible levels of erosion and sedimentation. Agisted livestock were removed in 2007 to ensure the maintenance of a satisfactory level of ground cover. Timely spring and early summer rains in 2008 subsequently resulted in a very good level of ground cover, and livestock were again reintroduced in April 2009.

Excellent rain during 2010 ensured more than adequate pasture cover over all agisted areas, with no evidence of land degradation or erosion.

As discussed in Section 2, all active surface mining and rehabilitation areas fall within Baal Bone's Surface Water Management System which is subdivided into "clean water" and "dirty water" systems. Features of the "clean water" system includes upslope diversion banks, levee banks, lined channels and drains and reed beds within the Ben Bullen Creek; features of the "dirty water" system include graded contour banks, containment bunds, primary arrestor/grit traps, sediment dams, water treatment plant and settlement dams.

The dirty water system is incorporated into Baal Bone's process water circuit. This is essentially a closed circuit which provides water for the CHPP, in addition to water for dust

suppression, fire fighting and general underground operations. Water from this circuit is reused and is only discharged from site through a Licenced Discharge Point during high intensity rainfall events..

The Overshot Dam is located on the Colliery's northern boundary and is the final point of containment / retention for the clean water system. It also provides an additional opportunity for settlement and/or other treatment if required. The discharge from the Overshot Dam is Licenced Discharge Point No. LDP1 as noted on EPL 765.

LDP1 discharged water offsite during the eight months between and including February to September.

### 3.2.1 Activities during the Reporting Period

Rehabilitation activities during 2010 were limited to aerial topdressing (of seed and fertiliser) over all the rehabilitation areas at the end of November.
Planting of riparian vegetation (tube stock) along the restoration works on the Ben Bullen Creek diversion was completed during 2010. Some tube stock planting of shelter areas was also incorporated into the pasture areas in the northern open cut rehabilitation precinct.
Further details regarding rehabilitation activities at Baal Bone are included in Section 5.

## 3.3 Surface Water

Baal Bone has engaged Ecowise Environmental Pty Limited, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis of a range of surface and subsurface waters.

Baal Bone maintains a network of 5 licenced Discharge and Monitoring Points in accordance with EPL 765 (viz. LD2, LD3, LD6, LDP1 and WMP1) (**Drawing 1 & Drawing 2**). In addition to the licenced discharge points, another 23 monitoring points are located throughout the site and the data obtained is used to assist internal management and planning decisions.

A description of discharge and monitoring sites, analyses conducted, frequency of sampling and concentration limits (where applicable) are shown in **Table 3.1** below.

*Table 3.1. Baal Bone Colliery Water Monitoring Locations and Monthly Analysis*

NB: Monitoring points highlighted in yellow indicate Licenced Discharge and Monitoring Points.

| Sample Name | Sample Location | Frequency | Pollutants Analysed | EPL Limits Apply |
|---|---|---|---|---|
| BBLD2 | EPL Monitoring Pt No.2. In sump at discharge from STP maturation pond to transpiration bed area | Monthly during discharge | Oil & grease, TSS, pH, BOD, faecal coliforms, nitrogen, phosphorus | Not specified |
| BBLD3 | EPL Monitoring Pt No. 3. In stilling pond at pipe outlet of south mine dewatering | Monthly during discharge | EC, oil & grease, sulphate, iron, TSS, pH, MBAS, Pseudomonas, flow rate | Oil & grease, pH, TSS, |

| Sample Name | Sample Location | Frequency | Pollutants Analysed | EPL Limits Apply |
|---|---|---|---|---|
| | bores | | | |
| BBLD6 | EPL Monitoring Pt No. 6. In stilling pond at pipe outlet of north mine dewatering bore | Monthly during discharge | EC, oil & grease, sulphate, iron, TSS, pH, MBAS, Pseudomonas, flow rate | pH, iron, TSS |
| BBLDP1 | EPL Monitoring Pt No.11 Immediately below the pipe outlet or in stilling pool below spillway of overshoot dam | Monthly during discharge | EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness, MBAS, nitrogen, phosphorus | Oil & grease, pH, TSS, iron |
| BBWMP1 | EPL Monitoring Pt No. 12 Pool within Ben Bullen creek upstream of active surface mining area | Monthly (during flow) | EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness, nitrogen, phosphorus | Not specified |
| BBPOT | Potable water from main bathroom in Administration | Monthly | pH, EC, Hardness, heterotrophic standard plate count, total coliforms, E coli, Pseudomonas | |
| BBBH | Potable water from Washery bathroom | Monthly | pH, EC, Hardness, heterotrophic standard plate count, total coliforms, E coli, Pseudomonas | |
| BBLR | Leachate pond on western side of REA5 | Monthly | EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness | |
| BBMW No.5 | Mine water discharge pipeline adjacent to No. 5 Adit | Monthly (only if discharging) | Flow rate, pH, EC, TSS, iron, sulphates, oil & grease, MBAS, heterotrophic standard plate count, faecal coliforms, pseudomonas | |
| BBMW No.3 | Mine water discharge pipeline adjacent to No. 3 Adit | Monthly (only if discharging) | Flow rate, pH, EC, TSS, iron, sulphates, oil & grease, MBAS, heterotrophic standard plate count, faecal coliforms, pseudomonas | |
| BBPit 1 | Pit-top grit trap/oil separator (eastern) | Monthly (only if discharging) | pH, oil & grease, MBAS | |
| BBPit 2 | Pit-top grit trap/oil separator (western) | Monthly (only if discharging) | pH, oil & grease, MBAS | |
| BBPit 3 | Washery grit trap/oil separator | Monthly (only if discharging) | pH, oil & grease, MBAS | |
| BBDW | Dirty water dam | Monthly | EC, Iron, oil & grease, pH, Sulphate, TSS, Hardness, MBAS | |
| BBPRW | Process water dam | Monthly | EC, Iron, oil & grease, pH, Sulphate, TSS, Hardness, MBAS, heterotrophic standard plate count, pseudomonas | |
| BBSTP1 | STP Maturation Pond No 1 | Monthly | pH, BOD, Faecal coliforms, nitrogen, phosphorus | |

| Sample Name | Sample Location | Frequency | Pollutants Analysed | EPL Limits Apply |
|---|---|---|---|---|
| | | | | |
| BBSTP2 | STP Maturation Pond No 2 | Monthly | pH, BOD, Faecal coliforms, nitrogen, phosphorus | |
| BBBC | Box cut sump | Monthly | pH, EC, iron, sulphates | |
| BBBBC Mid | Ben Bullen Creek mid-way through site | Monthly (during flow) | Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBBBC End | Ben Bullen Creek upstream of the Overshot Dam | Monthly | pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBJ | Jews Creek junction with discharge channel from Overshot Dam (downstream of all mining operations and dewatering bore discharges) | Monthly (during flow) | Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBJC2 | Jews Creek upstream of mining operations, but below dewatering bore discharges | Monthly (during flow) | Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBJC3 | Jews Creek at confluence with un-named flowline from mine dewatering bore discharge | Monthly (during flow) | Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBJCH | Jews Creek headwaters upstream of all mining operations and mine dewatering discharges | Monthly (during flow) | Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus | |
| BBLW19 Sed Dam | North bore settlement dam | Monthly | EC, Iron, oil & grease, pH, Sulphate, TSS, hardness, MBAS, pseudomonas | |
| BBN 134 - Pipe 2 | Piezometer in Ben Bullen State Forest | Quarterly | pH, EC, Depth to water | |
| BBN 135 | Piezometer in Ben Bullen State Forest | Quarterly | pH, EC, Depth to water | |

BOD – Biochemical Oxygen Demand
COD – Chemical Oxygen Demand
EC – Electrical Conductivity
MBAS – Metheleyne Blue Active Substances
TSS – Total Suspended Solids

### 3.3.1 Interpretation and Review of Monitoring Results

Monitoring results for Baal Bone's seven licenced Discharge and Monitoring Points as required by EPL 765 are discussed below. Where available, samples were taken *monthly during*

*discharge* in accordance with the EPL. **Table 3.2** summarises the locations and months during which samples from the licenced Discharge and Monitoring Points were collected.

Results of these samples are tabulated below in **Table 3.3;** graphic interpretation of these results where the Licenced Discharge and Monitoring Points have Concentration Limits is included in **Figures 3.8 - 3.11**.

*Table 3.2. Baal Bone's Licenced Discharge and Monitoring Points – samples available for collection in 2010*

| EPL Point | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BBLD2** | YES | YES | NO | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| **BBLD3** | NO | YES | YES | YES | YES | NO | NO | NO | NO | NO | NO | YES |
| **BBLD6** | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES | NO | YES |
| **BBLDP1** | NO | NO | YES | YES | YES | YES | YES | YES | YES | NO | NO | NO |
| **BBWMP1** | NO | YES | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |

*Table 3.3. Summary of concentration levels recorded for DECCW licenced discharge points as required by EPL*

| EPL Point | Month | EC uS/cm | Oil & Grease mg/L | Sulphate mg/L | Iron mg/L | TSS mg/L | pH | BOD mg/l | Faecal Coliforms cos/100mls | Nitrogen mg/l | Phosphorus mg/l |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BBLD2 (STP)** | Feb | - | 4 | - | - | 191 | 8.3 | 87 | 3638 | 39.2 | 10.1 |
| | Apr | - | 2 | - | - | 52 | 8.9 | 28 | 39 | 6.1 | 1.86 |
| | May | - | 2 | - | - | 1072 | 7.9 | 46 | 2180 | 19.2 | 3.66 |
| | June | - | 2 | - | - | 264 | 7.5 | 54 | 30 | 14.7 | 3.39 |
| | July | - | 2 | - | - | 134 | 8.1 | 91 | 128 | 44.9 | 15.2 |
| | Aug | - | 2 | - | - | 56 | 7.5 | 50 | 4 | 7.6 | 3.27 |
| | Sept | - | 2 | - | - | 120 | 7.8 | 64 | 12 | 10.8 | 4.64 |
| | Oct | - | 5 | - | - | 182 | 7.6 | 68 | 420 | 6.1 | 4.44 |
| | Nov | - | 2 | - | - | 73 | 7.3 | 20 | 20 | 11.2 | 5.31 |
| | Dec | - | Volume lost in transit | - | - | 193 | 7.2 | 270 | 36 | 40 | 16.4 |
| | Feb | 6 | 2 | 227 | 4.0 | | | - | - | - | - |
| | Mar | 7 | 2 | 250 | 4.5 | | | - | - | - | - |
| **BBLD3** | Apr | 7 | 2 | 264 | 4.1 | | | - | - | - | - |
| | May | 5 | 2 | 270 | 5.2 | | | - | - | - | - |
| | Dec | 4 | 5 | 337 | 2.5 | | | - | - | - | - |
| | Oct | 2 | 2 | 178 | 0.25 | | | - | - | - | - |
| | Dec | 2 | 5 | 567 | 0.05 | | | - | - | - | - |
| **BBLD6** | Oct | 2 | 2 | 178 | 0.25 | | | - | - | - | - |
| | Dec | 2 | 5 | 567 | 0.05 | | | - | - | - | - |

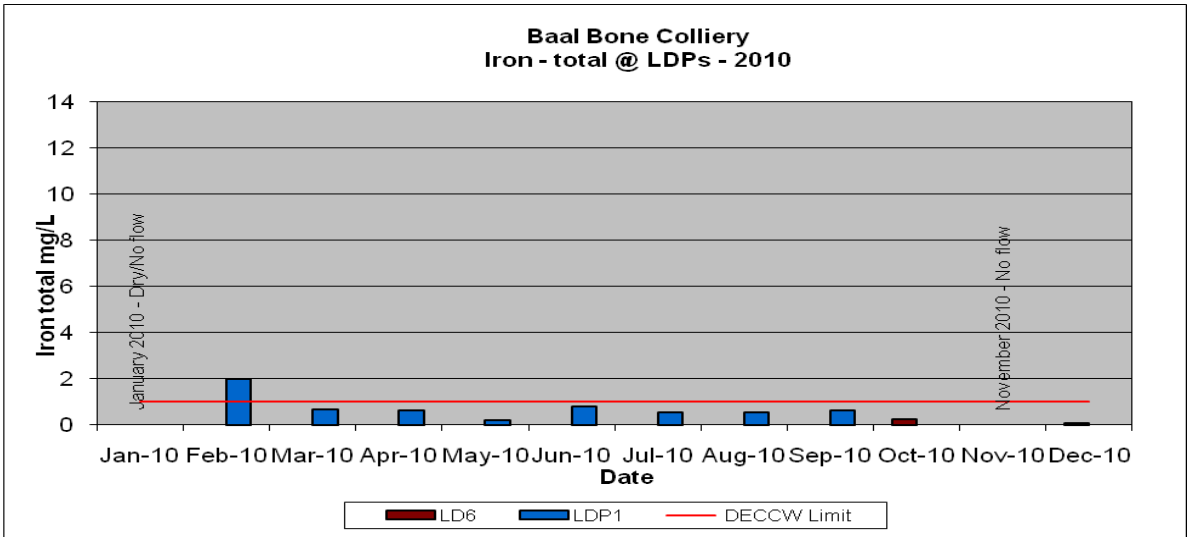



**Figure 3.8. Total Iron Levels of Samples Recorded in Relation to EPL Concentration Limit of 1.0mg/L.**

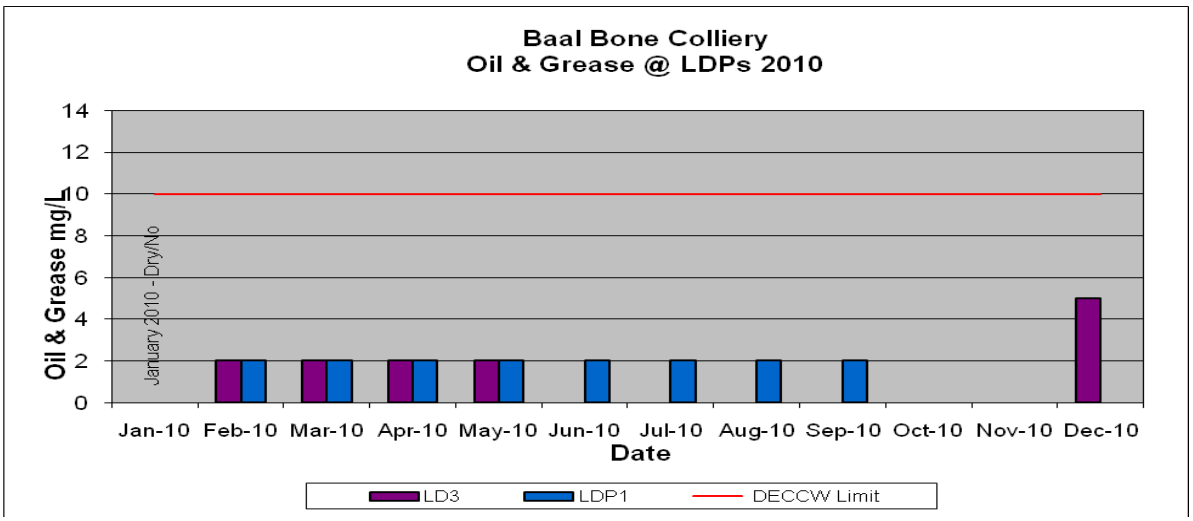



**Figure 3.9. Oil and Grease Levels of Samples Recorded in Relation to EPL Concentration Limit of 10mg/L**

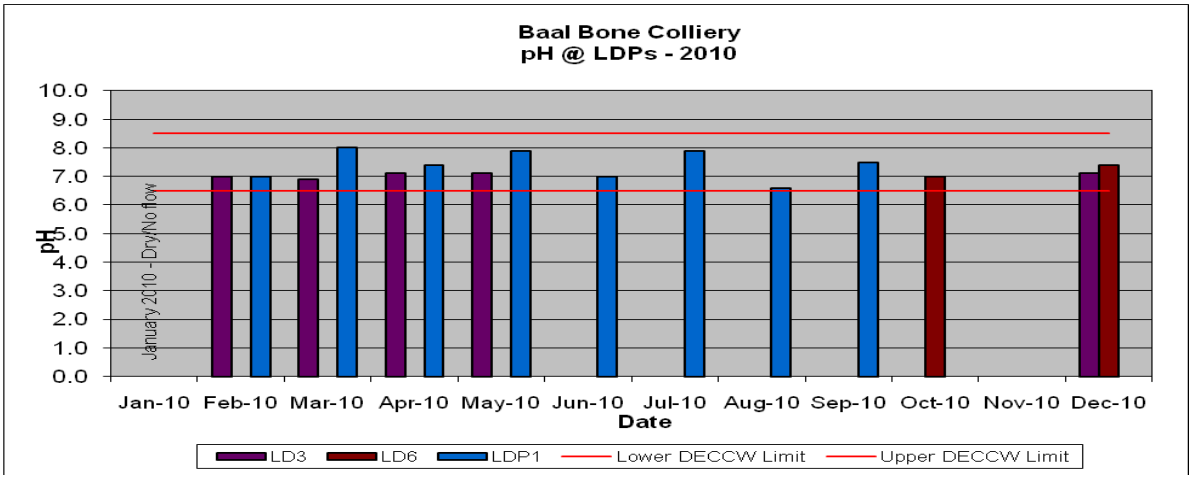


**Figure 3.10. pH Levels of Samples Recorded in Relation to EPL Range of 6.5-8.5.**

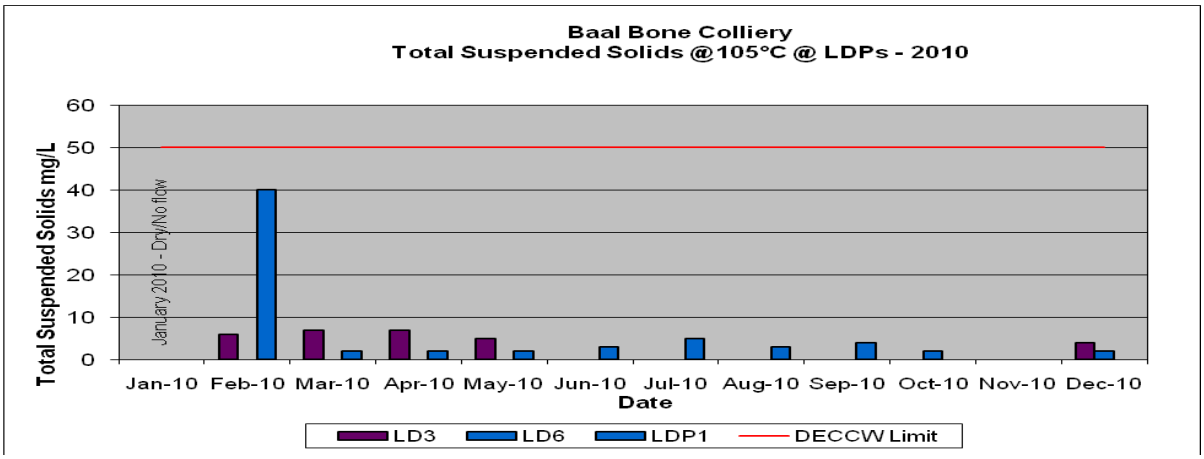



**Figure 3.11. TSS Levels of Samples Recorded in Relation to EPL Concentration Limit of 50mg/L** (Note: values shown as 2 were reported as being <2).

All samples recorded were within EPL Concentration Limits except for LDP1 measurement of iron in February 2010.
A summary of monitoring results for EPL discharge and monitoring points (those with specified Concentration Limits) can be found below:

- All samples for both TSS and Total Iron were within EPL specified concentration limits of 50mg/L and 1.0mg/L respectively- except for total iron at LDP1 in February.
- It is suspected that due to heavy rainfall in February after a number of months of lower rainfall may have lead to higher levels of iron entering the stream. No particular event is known to have occurred that would artificially spike this result.
- All samples returned oil and grease concentration levels of < 6mg/L, which is well below the EPL Concentration Limit of 10mg/L;
- All samples returned pH results that were within the upper and lower EPL Limits (8.5 and 6.5 respectively).

## 3.4 Ground Water and Pollution

Baal Bone Colliery currently has nine bores and piezometers licenced with NSW Office of Water (NOW); these are summarised in **Table 3.4**.

*Table 3.4 Licenced Bores and Piezometers*

| Licence Number | Expiry Date | Location / Use |
|---|---|---|
| 80BL136703 | 13/01/2013 | CHPP water make-up bore near UC1 (not used during reporting period) |
| 80BL135509 | 08/06/2012 | |

| | | |
|---|---|---|
| | | Borehole No. 6 near Rail Loop; previously used for dust suppression (low yielding; no longer used) |
| 80BL236132 | Perpetuity | Mine dewatering Longwall 1 (South Bore 1) |
| 80BL236134 | Perpetuity | Mine dewatering Longwall 1 (South Bore 2) |
| 80BL239077 | 18/06/2011 | Mine dewatering Longwall 19. North Bore. |
| 10BL601877 | Perpetuity | BBN175; LW29-31 groundwater monitoring piezo |
| 10BL601816 | Perpetuity | BBN176; LW29-31 groundwater monitoring piezo |
| 10BL601817 | Perpetuity | BBN177; LW29-31 groundwater monitoring piezo |
| 10BL601970 | Perpetuity | BBN 179; LW29-31 groundwater monitoring piezo |

The four groundwater monitoring piezometers were installed and equipped with data loggers in 2007 to gather background data and to monitor subsidence effects on local groundwater regimes as part of the SMP for LW 29-31.

Ian Forster from Aurecon Australia Pty Ltd (previously known as Connell Wagner) monitors data loggers in the piezometers on a regular basis to gather baseline data regarding groundwater level fluctuations in the vicinity of the Coxs River Swamp. Baseline data obtained prior to commencement of mining confirms a strong correlation between groundwater levels and prevailing climatic conditions; most particularly the relationship to rainfall.

At no time has there been any indication of mining related impacts in either of the two piezometers in the Coxs River swamp.

### 3.4.1 Ground Water Extraction

EPL 765 imposes volumetric limits on discharge from the north mine dewatering bore at LD6 of 12 ML/day; during the reporting period an average of 1.9841 ML/day was discharged.

Bore Licences 80BL136703 and 80BL135509 as issued by NSW Office of Water impose a maximum total extraction limit of 750 ML/year. As stated previously, the yield from Bore 80BL135509 has proven to be unreliable and its use has since been discontinued. There was no water extracted from Bore 80BL136703 during the reporting period.

During the reporting period, the mine dewatering bores discharged a total of 1968.359 ML into the Jews Creek.

## 3.5 Contaminated Land

Known contaminated or polluted lands at Baal Bone are limited to those affected by hydrocarbons. Hydrocarbon contamination is discussed in Section 3.17.

There were no environmental incidents recorded or additional areas of contaminated land identified during the reporting period.

## 3.6 Flora

Gingra Ecological Surveys submitted their annual monitoring report in December 2010 ,which summarises their LW29-31 SMP area monitoring completed during October and November 2010.

The results show that levels of species diversity recorded in 2010 were at or above the previously recorded range at each site.

The total number of species records in summer 2007 was 113 and in autumn 2008 it was 161 records. For the spring samplings there were 119 records in 2007, 141 records in 2008, 147 records in 2009 and 128 in 2010.

*Table 3.5 Plant Species Diversity for LW29-31 SMP Area*

| Site | Species Count | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Summer 2007 | Spring 2007 | Autumn 2008 | Spring 2008 | Autumn 2009 | August 2009* | Autumn 2010 | Spring 2010 |
| BB05 | 28 | 26 | 33 | 33 | 41 | NS | 46 | 44 |
| BB06 | 22 | 24 | 29 | 26 | 31 | NS | 31 | 30 |
| BB07 | 18 | 19 | 29 | 23 | 26 | NS | 29 | 30 |
| BB08 | 22 | 24 | 33 | 27 | 29 | NS | 35 | 37 |
| BB09 | 14 | 14 | 23 | 20 | 19 | 16 | 21 | 25 |
| BB10 | 9 | 12 | 14 | 12 | 10 | 10 | 14 | 13 |

*Additional requested survey

Comparison of results within the Baal Bone SMP area for spring samplings from 2007 to 2010 show no significant change in plant species diversity at any of the survey sites. This holds for the mesic (moisture associated) sites within the area of mining impact and the two swamp sites which are downstream from the subsidence management area.

Yorkshire Fog has increased in abundance at Long Swamp over the monitoring period (2007 to 2010). This appears to be related to improved seasonal conditions. Catsear has now been recorded at five sites. This also is related to improved seasonal conditions, in particular the break from the long term drought in south-eastern Australia. Similar observations have been recorded at other sites in the Great Lithgow area.

From the floral surveys undertaken to date there have been no endangered species found, however 2 vulnerable species and 1 species of regional significance have been identified in the area around Baal Bone. These include Capertee Stringybark *(Eucalyptus cannonnii)*, Clandulla Geebung *(Persoonia marginata)* and Blue Devil *(Eryngium vesiculosum)* respectively.

Potential habitat for both *E. cannonnii* and *P. marginata* are isolated to areas north of the current lease area and they have not been affected by mining activities on site. Baal Bone has developed a Biodiversity and Land Management Plan to ensure that site operations (in particular vegetation clearing and ground disturbing activities) do not potentially impact on these species.

Swamp vegetation is present along Baal Bone Creek and lower arms of its tributaries and at the Coxs River Swamp along the upper Coxs River. The vegetation is typically closed sedgeland with patches of closed scrub and emergent trees.

Trees present include Mountain Gum (*E. dalrympleana*) and Blackwood (*Acacia melanoxylon*). Shrub patches include the tea-trees, *Leptospermum continentale*, *Leptospermum obovatum* and *Leptospermum grandifolium*. The ground layer is dominated by *Carex gaudichaudiana* and Tussocky Poa (*Poa labillardieri*). Associated ground layer species include *Stellaria angustifolia*, *Epilobium gunnianum*, *Juncus sarophorus*, *Geranium homeanum* and Brooklime (*Gratiola latifolia*).

This vegetation type has a restricted distribution. It corresponds to the listed as Montane Peatlands and Swamps Endangered Ecological Community (EEC) under the NSW TSC Act. It does not correspond to the EPBC listed Temperate Highland Peat Swamps on Sandstone endangered ecological community.

Floral studies conducted by Gingra as part of Baal Bone Part 3A Environmental Assessment have confirmed that no significant modification of swamp vegetation will occur as a result of the current or proposed mining operations and that mining operations are not likely to increase the impact of any relevant key threatening process on this community.

## 3.7 Fauna

Biodiversity Monitoring Services (formerly known as Mount King Ecological Surveys) completed a seasonal survey of the LW29-31 SMP area in late December 2010 but was postponed due to heavy rainfall until January 2011. The results of this survey are reported as Spring 2010 in the table and discussion below.

Measurements of habitat characteristics derived from trap site descriptions have been used to provide an index of habitat complexity that can be helpful in determining changes over time of the habitats surveyed in the SMP Area. One index system used is that developed by Catling and Burt (1995), called the Habitat Complexity Score. This system scores the following parameters: Tree cover, tall and short shrub cover, ground cover, logs/rocks and litter cover. The scores range from 0 to 3, hence the maximum score is 18. The Habitat Complexity Scores for each site are given in the table below, together with the mean woodland results from 2005 to 2010.

*Table 3.6 Habitat Complexity Scores for LW 29-31 SMP Area*

| | Spring 2005 | Summer 2006 | Spring 2007 | Spring 2008 | Spring 2009 | Spring 2010 |
|---|---|---|---|---|---|---|
| Woodland1 | 13 | 16 | 15 | 15 | 17 | 16 |
| Woodland2 | 14 | 14 | 16 | 17 | 16 | 17 |
| Mean Woodland | 13.5 | 15 | 15.5 | 16 | 16.5 | 16.5 |
| Creek | 16 | 16 | 16 | 16 | 16 | 17 |
| Swamp | - | - | - | 13 | 17 | 16 |
| Overall | 14.3 | 15.3 | 15.6 | 15.2 | 16.5 | 16.5 |

These scores indicate moderate to high habitat complexity. These scores also show that all sites provide good habitat for ground-dwelling mammals and woodland birds.

A total of 19 native mammal (plus three introduced), 61 bird, five reptile and three amphibian species have been located within or near Longwall 29-31 SMP Area at Baal Bone Colliery during 2010. At present, 27 native mammal, 86 bird, 12 reptile and five amphibian species are known to occur within the LW29-31 SMP Area.

The number of birds and native mammals located in 2010 was similar to or slightly higher than in earlier years, the number of reptile and amphibian species was lower. As expected with continued surveys, the number of species located within the SMP area has increased over the years. It is expected that the number of new species located each year will continue to increase and finally level out.

New species located during 2010 are the Eastern Broad-nosed Bat, Fan-tailed Cuckoo, Pallid Cuckoo, Buff-rumped Thornbill, Hooded Robin, Flame Robin and Lesueur's Velvet Gecko.

Overall there have been 11 threatened species located within the LW29-31 SMP Application Area at Baal Bone Colliery as a result of surveys since 2005. In 2010, the following threatened species were located: Gang-gang Cockatoo, Brown Treecreeper, Scarlet Robin, Flame Robin, Hooded Robin, Varied Sittella, Little Pied Bat, Eastern False Pipistrelle, Eastern Bent-wing Bat and Greater Broad-nosed Bat. The first six species are part of a suite of threatened species that are listed partly because of their declining population status within the western slopes of NSW. This area (called the sheep-wheat belt) has undergone extensive clearing and much of the woodland habitat preferred by these species has been lost. However, in the Newnes Plateau region woodland habitat has been retained (albeit logged), and such bird species are still to be located. None of these threatened bird species would be directly affected by subsidence-induced changes to their preferred habitat.

The report concluded by noting that due to the monitoring data set that has been accumulated over the past six seasons (2005 to 2010), it is now possible to assess any differences in the biodiversity and habitat condition of those sites that are subject to underground mining in the future. This comparison showed that there are no significant differences in the biodiversity and habitat complexity over the years. It is concluded that, at present, there are no discernable impacts from underground mining of LW29-31 at Baal Bone Colliery upon the fauna on the surface. A full analysis of the year's data will be undertaken after the summer survey.

## 3.8 Weeds

A structured weed eradication campaign was continued in 2010. A full land management review of the Baal Bone site was undertaken by Land Asset Management Pty Limited in February 2010, which identified targeted species and their location.

A comprehensive weed spraying program was subsequently completed during March / April and again in November / December. These programs targeted Blackberry, St John's Wort and Biddy Bush *(Cassinia arcuata).*

Ongoing maintenance spraying will continue in 2011 and will also include isolated populations of Serrated Tussock (*Nassella trichotoma*) and Scotch Thistle (*Onopordum acanthium*).

## 3.9 Blasting

No blasting was conducted at Baal Bone during the reporting period.

## 3.10 Operational Noise

There were no changes to the operational noise profile during the reporting period, nor were there any noise related complaints.

## 3.11 Visual, Stray Light

All lighting associated with the CHPP and the UC1 conveyor/ROM stockpile has been designed and constructed so as to minimise glare and stray light. No complaints have been received during the reporting period in this respect.

## 3.12 Aboriginal and European Heritage

### 3.12.1 Aboriginal Heritage

In early 2007, an Indigenous Heritage Assessment was undertaken in conjunction with preparation of the LW29-31 Subsidence Management Plan (SMP) application. This assessment identified a potential rock shelter site (BBC-RS1) located above LW30 in the Ben Bullen State Forest.

Condition 23 of the SMP approval required Baal Bone to reach agreement with the DECC and the local Aboriginal community with regard to the ongoing management of this potential rock shelter site.

A draft AHMP was prepared and circulated to all participants for review and comment in November 2008. No submissions were received from the groups and the final report was submitted to DECC in December 2008.

Extraction of LW30 beneath BBC-RS1 occurred during the 5$^{th}$ to 15$^{th}$ of July 2010. During this time Baal Bone inspected the site twice weekly to ensure that public safety was not compromised. Additional barrier tape and signage was installed as a precautionary measure.

Following longwall extraction beneath the site, the area was resurveyed and movement vectors were calculated. This data confirms that the rock which forms the main shelter (overhang) moved 536mm in a westerly direction and subsided approximately 717mm (10mm accuracy). Never-the-less, there was no visible damage caused to BBC-RS1 as a result of the extraction of LW30.

### 3.12.2 European Heritage

No European Heritage Sites have been identified within the Baal Bone mining lease.

## 3.13 Natural Heritage

No natural heritage sites have been identified within the Baal Bone mining lease. However, the Gardens of Stone National Park lies approximately 5 kilometres northeast of the Colliery and the Blue Mountains World Heritage Area is located approximately 80 kilometres to the southeast of the Colliery.

The Ben Bullen State Forest covers much of the lease area; it is anticipated that this will be gazetted as a State Conservation Area at some time in the future.

## 3.14 Spontaneous Combustion

No spontaneous combustion events occurred in 2010.

Baal Bone has a Spontaneous Combustion Management Plan for the ROM stockpile. The plan principally involves regulating the duration of ROM storage on the stockpile to reduce residence time and therefore potential oxidation, and monitoring of internal stockpile temperatures.

## 3.15 Bushfire Management

There was no outbreak of bushfire during the reporting period at Baal Bone Colliery.

In the event of a bushfire with the adjacent State Forest, Forests NSW would assume responsibility for all fire fighting and emergency response activities. An agreement was been reached between Forests NSW and Baal Bone regarding use of the Colliery's helipad, first aid room and process water dam in emergency situations.

In the event that a bushfire is ignited on company owned land or where bushfire poses a threat to the mining operations, the Baal Bone's Emergency Response Procedure will be activated.

In addition, site management will ensure that:

- all boundary roads around the land within the Colliery freehold land are maintained in a condition suitable for use as fire breaks and access tracks during an emergency situation;
- a water cart at the Washery can assist in fire fighting activities;
- main access road and helipad are maintained suitable for use by emergency services;
- dams, voids and any other areas that may be utilised as watering points can be accessed by fire fighting equipment;
- portable radios are used at the time of emergency solely by the emergency response team who are trained and are provided with protective clothing;
- site earthmoving equipment can be utilised; and
- emergency phone, fire extinguishers and fire depots are located at strategic locations around the surface facilities.

Bushfire preparedness has also been included in Baal Bone's Biodiversity and Land Management Plan.

## 3.16 Mine Subsidence

### 3.16.1 Current Approvals

A *Subsidence Management Plan* for development and extraction of LW 29-31 was lodged with DPI-MR in June 2007. Approval was received from The Deputy Director General on 7 December 2007, with the approved period of mining to expire on 1 December 2014 (or at the expiry/cancellation of Baal Bone's Coal and Mining Leases).

Longwall production in the first panel (LW29) of the new SMP area commenced on 6 July 2009. Extraction of LW30 commenced on 9th of June 2010 and as of 31 December 2010 the faceline had retreated 1616 m to chainage 54 m.

### 3.16.3 LW30 Subsidence Development (Summary of Survey Results)

*Table 3.7 LW30 Subsidence Survey Data Summary*

| Parameter | Predicted Results | Maximum measured result |
|---|---|---|
| Vertical subsidence (mm) | 1400 - 1600 | 1538 |
| Horizontal movement (mm) | 400 | 188 |
| Tensile strain (mm/m) | 9 - 21 | 13.7 |
| Tilt (mm/m) K=5.0 | 32 - 52 | 253.2 |

Some tension cracking, as predicted, has appeared parallel to the gateroads and across the centre of the panel, including one crack that exceeded predictions. This crack is discussed in section 3.16.2 below.

Routine scientific and survey monitoring of impacts on rock features, escarpments, and surface and groundwater regimes continued, as did seasonal monitoring of flora and fauna.
Anomalous groundwater behaviour in several monitoring bores as reported previously appears to have stabilised and is showing signs of normalising.
All other monitoring results are within expected / predicted parameters with the exception of the cracking noted in section 3.16.2.

Routine and scheduled seasonal monitoring will continue.

There have been no subsidence impacts observed outside the nominated angle of draw.

### 3.16.4 Protection of the Wolgan Escarpment

Stress change monitoring instruments have been installed and commissioned in the vicinity of the two pinch points on LW31. Stress changes in the rock strata are being monitored using a remote logger as Longwalls 29, 30 and 31 are progressively extracted. Stress cells are logged on a twice daily cycle and information downloaded periodically for analysis by SCT Operations.

Results received to date confirm that neither instrument has registered any significant stress change associated with the mining of LW29; although this is not surprising as the distance between LW29 and the escarpment is large enough for there not to be any change.

SCT Operations conducted a review of subsidence monitoring and stress cell monitoring conducted prior to longwall 30. Their report stated that: *No vertical subsidence movements have been measured in the vicinity of the Wolgan Escarpment. No significant vertical subsidence movements ( greater than 20mm) have been measured outside 64m from the goaf edge of longwall 30, equivalent to an angle of draw of 18 degrees.*

*Reflector surveys along the edge of the Wolgan Escarpement did not show any significant movement during 190m of longwall retreat in the early stages of mining longwall 30. Additonal surveys will continue to monitor this.*
*Small magnitude ground movements are routinely observed remote from longwall mining activity and the characteristics of movements observed so far between longwall 30 and the Wolgan Escarpement are consistent with the movements that would be expected.*

### 3.16.2 LW30 Start Line Crack Notification

In accordance with Condition 18, Incident and Ongoing Management Reporting, of the Baal Bone Colliery Longwalls 29-31 Approval Conditions, notification was provided for the following impacts
Condition 18(a) requires notification of *any significant unpredicted and/or higher-than-predicted subsidence and/or abnormalities in the development of subsidence.*

The first exceedance reported related to the width of a tension crack around the start of Longwall 30 at Baal Bone Colliery. The Trigger Action Response Plan (TARP), contained within Baal Bone's LW29-31 SMP Land Management Plan (Revision 2, June 2009), states that surface cracking > 200mm in width constitutes a major impact and initially requires notification to the Interagency Committee, the PSE and other appropriate parties under SMP Approval Condition 18.

Condition 18(b) requires notification of *any exceedance of predicted impacts on surface and groundwater resources and/or natural environment that may have been caused (whether partly or wholly) by subsidence*.

The second exceedance reported concerned a minor impact on surface watercourses as defined by the TARP contained with Baal Bone's LW29-31 SMP Environmental Monitoring Program (Revision 1, May 2009). This impact relates to potential bed damage in a watercourse where water is seen to disappear and initially requires notification to the appropriate parties under SMP Approval Condition 18. (Revision 1, May 2009).

This impact relates to potential bed damage in a watercourse where water is seen to disappear and initially requires notification to the appropriate parties under SMP Approval Condition 18. It should be noted that both of the subsidence impacts as notified above are related to the same set of circumstances at the start of Longwall 30 (LW30). This was spotted during a period of heavy rainfall. The stream is ephemeral and usually does not contain water. Since the notification, monitoring of the creek has been ongoing and lesser signs of excessive water loss have been noted.

Routine inspections of the surface above LW30 first identified initial cracking around the start area on of the 9th of July 2010. At that time the width of the crack was within the predicted range, however a file note was made to recheck the area regularly as there was a relatively steep slope below the crack, which also ran in roughly the same direction as the longwall retreat.

Weekly visual monitoring was continued and during the inspection of 23 July 2010 it was confirmed that the width of the crack had developed to a point where it was more than likely going to trigger the TARP. A verbal notification of the situation was subsequently made to the Acting Subsidence Executive Officer (I&I NSW) and a commitment given to lodge a formal written notification in the event that the situation developed further.

Concurrent with an inspection on 30 July 2010, Baal Bone erected additional warning signs in the vicinity and barrier tape was placed along several sections of the crack.

Pre-emptive discussions and a site inspection were conducted with the Soil Conservation Service (Lithgow) to evaluate the most suitable remediation procedure and initial contact was made with Forests NSW (Macquarie Region) to confirm specific approval and/or other requirements they may have in regards to the undertaking of site works.

Dr Ken Mills of SCT Operations Pty Ltd was also contacted and asked to review the location and magnitude of this subsidence crack in the context of experience of subsidence movements and other cracks observed at the mine and elsewhere. Dr Mills provided a report dated 25 August 2010 and in this he noted that:
*Our assessment indicates that the location and opening of the subsidence crack at the commencement of Longwall 30 is consistent with the subsidence behaviour expected at the start of a longwall panel in sloping terrain.*

*At the start of each longwall panel, the two components of horizontal movement occur in the same direction because movement toward the goaf is also the direction of the retreating longwall panel. As a result of the superposition of these horizontal movements, subsidence cracks at the start of each panel are commonly larger than anywhere else in the panel.*

*Horizontal subsidence movements in sloping terrain are typically observed to occur in a direction toward the valley floor (i.e. a downslope direction). These movements are caused by lateral strata dilation that occurs as the ground subsides vertically. In sloping terrain, this lateral dilation is unopposed on the valley side with the result that the ground moves laterally toward the valley. The magnitude of downslope movements varies with the geological setting and the steepness of the slope but movements of up to 30% of vertical subsidence or 500mm are typical in moderately steep terrain such as that at the beginning of Longwall 30. The mechanism that causes downslope horizontal movements also causes stretching or tensile*

*cracking at the top of slopes and compression, valley closure, and upsidence in the bottom of valleys.*

*At the start of Longwall 30, the coincidence of a slope in the direction of mining and the start of the panel has led to coincidence of systematic horizontal movements and downslope movements. The observed subsidence cracking is the culmination of these two horizontal movements.*
Baal Bone's routine inspection of 27 August 2010 confirmed that the magnitude and extent of impact had increased significantly, and that a major impact, as defined by the TARP in the LW29- 31 Land Management plan.
.
There have been no subsidence impacts observed outside the nominated angle of draw.

## 3.17 Hydrocarbon Contamination

ENSR Australia has been engaged to conduct an annual review of the groundwater monitoring wells at Baal Bone during February 2010. The results of this monitoring program confirmed that activities at the site have resulted in contamination of shallow groundwater/ the contamination previously identified was localised and associated with known point sources such as fuel storage areas.
The results of the audit indicated an improvement or reduction in groundwater contamination concentrations with petroleum concentrations across a majority of the site reporting a decrease from previous years. AECOM, the consultants who conducted this audit recommended that the groundwater monitoring program continues so that adverse impacts to shallow groundwater in the pit top and CHPP vicinities can be readily identified and managed accordingly. As such, Baal Bone will be engaging AECOM to conduct another annual review of the pit-top groundwater monitoring wells in May 2011.

## 3.18 Methane Drainage and Ventilation

During the reporting period, monthly gas bag samples from the underground ventilation system were analysed by Coal Mines Technical Services, a NATA accredited company.

Results from the sampling completed throughout the reporting period confirm non-detectable levels of methane at Baal Bone Colliery (<0.01%). Consequently, methane drainage is not required at Baal Bone.

## 3.19 Public Safety

Fences are in place around the mining lease area, with all other boundary gates locked and maintained in correct working order. All access points onto the mine area are signposted to warn the public of Baal Bone Colliery's mining operations and of the risks involved. Warning signs have also been erected along public tracks in the Ben Bullen State Forest warning of mine subsidence and prohibiting entry to unauthorised persons.

All employees and contractors who enter the mining operations or workshop areas are inducted and must be suitably trained. All visitors must sign in and be accompanied by an employee or

staff member of the mine if they have not been inducted by the Safety and Training Superintendent.

The only incident relating to public safety during the period was the larger than expected subsidence crack at the beginning of LW 30. This is discussed in detail in section 3.16.2.

## 3.20 Other Issues and Risks

### 3.20.1 Reportable Incidents

Pursuant to Xstrata's Categorisation of incidents, any incident that falls into the categories below must be reported to the Group Environment and Community Manager, the General Manager for Open Cut or Underground Operations (depending on the type of incident) and the Chief Operating Officer.

Category I: An incident that has caused negligible, reversible environmental impact, requiring very minor or no remediation. For example, exceeding EPL Limits or a hydrocarbon spill >20L.

Category II: An incident that has caused minor, reversible environmental impact, requiring minor remediation. For example, Hydrocarbon spill >20L but <205L AND contained on site.

Category III: An incident that has caused moderate, reversible environmental impact with short-term effect, requiring moderate remediation. For example, illegal discharge offsite that causes local but reversible damage. Also, a hydrocarbon spill <205L that was not contained readily or a spill of any amount of hydrocarbon into public waterways.

Category IV: An incident that has cause serious environmental impact, with medium-term effect, requiring significant remediation. For example, an incident that requires a remediation program over 1-12 months.

Category V: An incident that has caused disastrous environmental impact, with long-term effect, requiring major remediation. For example, an incident that requires a long-term remediation program over 12 months.

There was only one environmental incident recorded by Baal Bone during the reporting period; this related to the Subsidence tension crack in LW30 previously discussed in Section 3.16.2

There were no fines or penalties recorded during the reporting period

### 3.20.2 Audits Conducted During the Reporting Period

In an order to assess our environmental performance at Baal Bone and to plan and implement a process of continual improvement, the audit below was conducted during 2010. These included:

- Hazardous Material Audit

The Hazardous materials audit and risk assessment was undertaken in 2010 by AECOM as a requirement following notification of DECCW under "Duty to Report Contamination under the Contaminated Land Management Act 1997".

The Hazardous Materials Audit and risk assessment found a number of minor non compliances, mainly due to the factor in consideration not being ALARP or As Low As Reasonably Practicable. Most of these minor non compliances were within the Coal Handling Preparation Plant.
A review of the mine documentation, required as part of the NSW Occupational Health and Safety (Dangerous Goods Amendment) Regulation -2005 and the documents required under the Xstrata standard (HSEC Std3.08) indicated that all documents complied with the regulations and standard.

# SECTION 4.0: COMMUNITY RELATIONS

## 4.1 Environmental Complaints

In accordance with Baal Bone Health, Safety, Environment and Community (HSEC) Procedure PRO 01.09.01.02.009 (Community Complaints Management), Baal Bone Colliery has a comprehensive system in place to document and respond to community complaints in a timely manner and to maintain a comprehensive complaints database.

Consistent with the Mine's Environmental Protection Licence, Baal Bone maintains a 24 hour telephone complaints line and answering service for the purposes of receiving and responding to any complaints from members of the public in relation to activities conducted within the Baal Bone Colliery.

Upon receipt of a complaint, the following details are obtained from the complainant:

- Date of complaint;
- Notification method;
- Date of incident;
- Name of complainant;
- Contact details of complainant;
- Type of complaint;
- Actions taken;
- Persons notified; and
- Details of follow up actions taken, if required.

Following the receipt of a complaint, a thorough investigation of the complaint is undertaken and the complainant advised of the results of the investigation. Any action to be taken to prevent a recurrence is undertaken as soon as practicable.

No community complaints were received by Baal Bone during the 2010 reporting period.

## 4.2 Community Liaison

### 4.2.1 Community Initiatives

During 2010 the following community support initiatives were implemented:

- Prize sponsorship of the Portland Art Show
- Sponsorship of team in the Movember Campaign
- Sponsorhip of book prizes for the Cullen Bullen School annual speech day
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.
- Sponsorship for Lithgow Show Society
- St Patrick School – Air-conditioning of Classrooms
- Cooerwull School – Computer Monitors

- Cullen Bullen Community – Install light for flag pole
- Portland Golf Club – Don Bender Memorial
- Million Paws – Sponsorship in local paper (advertisement)
- MS Walkathon
- Portland Development Association – Portland Springfair

Cancer Council – Biggest Morning

Planned community involvement activities for 2011 essentially remain unchanged and include:

- Augmentation of school resources at Wallerawang Public School
- Sponsorship of the Life Education Van to attend Wallerawang and Cullen Bullen Primary Schools
- Prize sponsorship of the Portland Art Show
- Sponsorship of team in the Movember Campaign
- Sponsorhip of book prizes for the Cullen Bullen School annual speech day
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.
- Sponsorship for Lithgow Show Society
- Cullen Bullen Progress Association – Upgrading Cullen Bullen Progress Hall

### 4.2.2 Community Consultative Committee

The Baal Bone Colliery Community Consultative Committee (CCC) has been established to provide a formal conduit for exchange of information and views between the local community and Baal Bone's Management Team.

Membership of the current Baal Bone CCC include:

- Ray Blackley (Resident)
- Barbara Milne (Resident)
- David Speirs (Adjacent landholder)
- Gary Wallace (Lithgow City Council)
- Mark Snow (Principal, Cullen Bullen Public School)
- Lawrie Ireland (Operations Manager)
- Diana Barnes (Environment and Community Coordinator)
- Mark Bulkeley (Safety and Training Superintendent)

The CCC met at Baal Bone on the 20th May. The 2nd CCC meeting was planned for December but due to staff turnover and prior commitments of CCC members, it was moved to early 2011. Regular agenda items included:

- Operations Manager's update
- Health and Safety Manager's update
- Environment Manager's update
- Open Cut rehabilitation update
- General Business and any other issues of concern from the community

The Baal Bone CCC is scheduled to meet again on 17th May 2011.

4.2.3 Baal Bone Newsletter

Baal Bone Colliery circulates a periodic community newsletter, *The Baal Bone Community Newsletter*, to approximately 250 neighbouring residents, to selected locations in Lithgow, Wallerawang and Portland, in addition to all Baal Bone employees and contractors.

The newsletter provides topical information regarding the mine's operational progress, environment and safety performance, and other areas of general interest including site rehabilitation and mine closure.

The last newsletter was not distributed in 2010 due to staff change over, however the next edition is scheduled for distribution in May 2011.

# SECTION 5.0: REHABILITATION (in this AEMR period)

## 5.1 Buildings

No buildings were renovated or removed during the reporting period.

5.2 Rehabilitation of Disturbed Land5.2.1 Status of Land Shaping and Rehabilitation Works Completed During 2010

During the 2010 reporting period 462540 t of coarse reject material from the CHPP was placed in the designated reject emplacement area. This material has been strategically placed around in and around the southern open cut pit to create the final design landform. Drainage paths, contour drains, ridgelines, and emplacements are being shaped in undulating informal profiles in keeping with natural landforms of the surrounding environment.

Rehabilitation activities are progressing in line the schedule proposed in the July 2009 MOP, notwithstanding the previous drought conditions. With the inclusion of the LW29-31 SMP area, the final rehabilitation of the fine and coarse reject emplacement area in the southern open cut precinct will not be commenced until after the cessation of mining in late 2012 (**PLAN 1**).

During 2010 approximately 90 ha of native revegetation was topdressed using Organic Life fertiliser at a rate of 500kg/ha and approximately 60 ha of improved pasture rehabilitation was also topdressed using Grower 12 fertiliser at a rate of 300 kg/ha.

All topdressing was completed in late November using a helicopter. Improved pasture areas also received an additional 20kg/ha of ryegrass and white clover seed.Current rehabilitation status at the end of the reporting period is shown on **PLAN 1**. A summary of rehabilitation works at the start of the MOP period (July 2009), an estimate for the end of the MOP period (July 2016) and actual rehabilitation completed during 2010 AEMR reporting period are detailed in **Table 5.1**.

5.2.3 Ben Bullen Creek Rehabilitation Project

In 2010 Baal Bone completed the Ben Bullen Creek Rehabilitation project.

This was as part of a larger Catchment Management Authority project in the Upper Jews Creek area.
The section rehabilitated was on an adjacent landholders property and not part of Baal Bone mine rehabilitation liability. The project was partially funded by Xstrata Coal NSW as part of their Corporate Social Involvement donations for 2010.

*Table 5.1 Summary of Rehabilitation Performance*

| | Area Affected/Rehabilitated (hectares) | | |
|---|---|---|---|
| | **Start of MOP (July 2009)** | **End of 2010 AEMR Reporting Period** | **End of MOP Period (July 2016)** |
| **A: MINE LEASE AREA** | | | |
| **A1 Mine Lease(s) Area** | 5002 ha | | |
| **B: DISTURBED AREAS** | | | |
| **B1 Infrastructure area** (other disturbed areas to be rehabilitated at closure including facilities, roads) | 70.54 ha | 70.54 ha | Nil |
| **B2: Active Surface Mining Area** (excluding items B3 - B5 below) | Nil | Nil | Nil |
| **B3 Waste emplacements (dozer push and dumps in N and S)** (active/unshaped/in or out-of-pit) | 44.36 ha | 44.36 ha | Nil |
| **B4 Tailings emplacements (REA 5)** (active/unshaped/uncapped) | 9.88 ha | 9.88 ha | Nil |
| **B5 Shaped waste emplacement** (awaits final vegetation) | 5.60 ha | 5.60 ha | Nil |
| **ALL DISTURBED AREAS** | 130.38 ha | 130.38 ha | Nil |
| **C REHABILITATION PROGRESS (Cumulative)** | | | |
| **C1 Total Rehabilitated area** (except for maintenance) | 134.87 ha | 134.87 ha | 270.87 ha |
| **D: REHABILITATION ON SLOPES (Cumulative)** | | | |
| **D1 10 to 18 degrees** | 38.25 ha | 38.25 ha | 38.25 ha |
| **D2 Greater than 18 degrees** | 2.5 ha | 2.5 ha | 2.5 ha |
| **E: SURFACE OF REHABILITATED LAND (Cumulative)** | | | |
| **E1 Pasture and grasses** | 59.99 ha | 59.99 ha | 89.39 ha |
| **E2 Native forest/ecosystems** | 74.88 ha | 181.48 ha | 181.48 ha |
| **E3 Plantations and crops** | Nil | Nil | Nil |
| **E4 Other** (include non-vegetative | Nil | Nil | Nil |

| | | | |
|---|---|---|---|
| outcomes) | | | |

## 5.3 Other Infrastructure

No other rehabilitation was undertaken during 2010 as a result of construction or decommissioning of site infrastructure.

## 5.4 Rehabilitation Trials and Research

There has not been any formal rehabilitation trials or research carried out at Baal Bone during the reporting period.

## 5.5 Finalisation of a Detailed Mine Closure Plan

### 5.5.1 Mine Closure Planning

In accordance with Xstrata Coal NSW Sustainable Development Annexure 0038, 10.1 Mine Closure, Baal Bone is in the final stages of the preparation of a Detailed Mine Closure Plan.

Activities completed and/or initiated during 2010 have focussed on the following:

- Continuation of community consultation program
- Finalisation of cost to benefit and economic analysis of Landuse options (Minespex)
- Continuation of scientifically based Rehabilitation Maintenance and Monitoring Plan using the concept of Landscape Function Analysis (LFA) (DnA Environmental)
- Complete hydrological and geochemical analysis of post completion water cycle (Aurecon and GHD respectively)
- Undertake risk assessments for demolition and decommissioning, and also for lease relinquishment activities (HMS Consultants)
- 
- Review of planned closure budget for approved land uses (Minespex)
- Annual Phase 2 Contamination Review for soil and ground water (AECOM Australia)
- Assembly of Detailed Mine Closure Plan document; this details scope of all physical site works required, social mitigation/communication strategies, implementation costs, monitoring requirements, “sign off” and relinquishment procedures, closure indicators/milestones, timeline/critical path network etc. (Minespex)
- Peer review of Detailed Mine Closure Document (KMH Environmental)

Mine closure planning activities proposed for 2011 will focus on:

- Continuation of community consultation program
- Implementation of recommendations in Social Impact Assessment regarding redundancies

- Annual Phase 2 Contamination Review for soil and ground water (AECOM Australia)
- Continuation of annual review and monitoring program using the concept of LFA
- Finalise peer review of Detailed Mine Closure Plan document and distribute to all stakeholders.

### 5.5.2 Rehabilitation Liability Estimate

Early in 2009, GSSE was commission to recalculate Baal Bone's "close now" rehabilitation liability estimate. This sum was determined to be $9 262 066. This estimate was subsequently lodged with the Department in conjunction with the 2009 AEMR. Consequently, the security deposit as held by the Department was adjusted in December 2010 to reflect this amended figure.

GSSE have once again been commissioned by Baal Bone to review this estimate for inclusion in the 2010 AEMR. Their rehabilitation liability estimate for Baal Bone at the end the 2010 reporting period has been determined as $9 722 852.

# SECTION 6.0: ACTIVTIES PROPOSED IN THE NEXT AEMR PERIOD

## 6.1 Operations and Systems

Projects and targets for the 2011 reporting period include the following:

- Receive Part 3A Project Approval from the Department of Planning for the continued operations at Baal Bone.
- Pursuant to these conditions of approval, Baal Bone will prepare all required management plans and systems, plus install and establish all required monitoring equipment and programs
- Completion of extraction of LW31
- Continuation of SMP monitoring for LW 29-31 area
- Annual review and update of Baal Bone's EMS and E&C Risk Assessment
- Distribution of Detailed Mine Closure Plan

## 6.2 Rehabilitation

The majority of the rehabilitation works on both the north and south open cut precincts were completed during the 2008 reporting period. Focus for 2011 will continue to be on maintenance and/or improvement of rehabilitation works completed so far. Contingent upon climatic conditions at the time, it is anticipated that some reseeding and fertilising works may be undertaken in Spring 2011.

It should also be noted that the southern void area will be maintained as a coarse and fine reject emplacement area for the remainder of the life of mine. Whilst it may be progressively or temporarily rehabilitated if the opportunity arises, final rehabilitation will be completed concurrent with mine closure. Similarly, the general underground infrastructure areas including the pit-top administration, bathhouses, workshops, conveyors, CHPP and rail loop will not be decommissioned and rehabilitated until after mine closure occurs.

Anticipated rehabilitation works to be completed within 2011 AEMR reporting period will be limited to maintenance of all existing rehabilitation areas in both the northern and southern open cut precincts.

## 6.3 Community Relations

Community Relation projects for the 2011 AEMR reporting period include the following:

- Preparation of two community newsletters;
- Hosting of two CCC meetings;
- Support of the Black Coal Competency Traineeship
- Augmentation of school resources at a local Public School
- Sponsorship of the Life Education Van to attend several local Primary Schools

- Prize sponsorship of the Portland Art Show
- Sponsorship of team in the Movember Campaign
- Sponsorhip of book prizes for the Cullen Bullen School annual speech day
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.

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Xstrata Coal NSW Sustainable Development Annexure 0038, 10.1 Mine Closure (Version 2.0)