Mt Arthur Coal

bhpbilliton

resourcing the future

Annual Environmental Management Report

2011

Abbreviations

AEMR	Annual Environmental Management Report
ANZECC	Australian and New Zealand Environment Conservation Council
CCC	Community Consultative Committee
CHPP	Coal handling and preparation plant
CO_2-e	Carbon dioxide equivalent
dB	Decibels
dBA	Noise decibels (A-weighted)
dBL	Noise decibels (linear)
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services
DNV	Det Norske Veritas
DoPI	NSW Department of Planning and Infrastructure
EA	Environment Assessment
EC	Electrical conductivity
EEO	Energy efficiency opportunities
EMS	Environmental management system
EPL	Environmental protection licence
EPBC	Environment Protection and Biodiversity Conservation
GIS	Geographic information system
GJ	Giga joules
GPS	Global positioning system
g/m^2/mth	Grams per square metre per month
ha	Hectare
HRSTS	Hunter River Salinity Trading Scheme
HVAS	High volume air sampler
LA_{eq}(15 min)	Average noise energy over a 15 minute period
LED	Light-emitting diode
m	Metres
MAC20	Project to increase run-of-mine coal production to 20 million tonnes
MAN	Mt Arthur North
MCV1	McDonald's Void Site 1
mg/L	Milligrams per litre
ML	Megalitre
mm	Millimetres
mm/s	Millimetres per second
MSC	Muswellbrook Shire Council
m^2	Square metres
m^3	Cubic metres
NATA	National Association of Testing Authorities
NGER	National Greenhouse and Energy Reporting
NGO	Non-government organisation
NOW	NSW Office of Water
NTU	Nephelometric turbidity units
OCE	Open cut examiner
OEH	Office of Environment and Heritage
O&G	Oil and grease
pH	Potential hydrogen
PM_{10}	Particulate matter with a diameter of less than 10 microns
PRP	Pollution Reduction Program
SEWPAC	Department of Sustainability, Environment Water, Population and Communities
SMS	Short message service
TDS	Total dissolved solids
TEOMs	Tapered element oscillating microbalance samplers
TSC Act	Threatened Species Conservation Act 1995
TSS	Total suspended solids
µS/cm	Microsiemens per centimetre
µg/m^3	Micrograms per cubic metre
VB3	Visual Bund site
WAL	Water access licence
°C	Degrees Celsius

Front Cover: Aerial seeding rehabilitation site at Mt Arthur Coal

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1. Introduction

Mt Arthur Coal is an open cut coal mine located approximately 5 kilometres south west of Muswellbrook in the Upper Hunter Valley. Owned entirely by BHP Billiton, Mt Arthur Coal comprises both mature and new operations that are operated 24-hours, seven days a week (excluding Christmas Day and Boxing Day).

This Annual Environmental Management Report (AEMR) details Mt Arthur Coal's environmental and community performance for the 12 month period ending 31 December 2011. This report addresses mining and related operations for the Mt Arthur Coal complex which includes the Mt Arthur Underground Project and Mt Arthur Coal Consolidation Project. These operational areas are shown in Figure 1.

This AEMR is a statutory approval requirement and has been prepared in accordance with NSW Department of Trade and Investment Regional Infrastructure and Services (DTIRIS) *EDG03 Guidelines to the Mining, Rehabilitation and Environmental Management Process*.

This year's report was prepared in consultation with the Department of Planning and Infrastructure (DoPI) (known as Department of Planning until April 2011), Muswellbrook Shire Council (MSC), NSW Office of Water (NOW) and DTIRIS, and all additional requested reporting requirements have been included in this report.

The AEMR is distributed to a range of stakeholders that include government authorities, non-government organisations (NGOs), Community Consultative Committees (CCCs), libraries, local residents, other mines and BHP Billiton employees. The report is also available on the BHP Billiton website at www.bhpbilliton.com.

A dozer on a stockpile at Mt Arthur Coal's coal handling and preparation plant

2011 Summary

Operational Changes and Performance

- Extracted 19.6 million tonnes of run-of-mine (ROM) coal from open cut operations
- Continued construction and expansion activities associated with the mine's ongoing growth

Blasting

- Fired 127 blasts
- Effectively managed blasts to comply with regulatory limits at all monitoring sites
- Submitted a revised blast management plan to DoPI for approval
- Postponed 104 blasts due to unfavourable weather conditions to reduce impacts on residents
- Continued use of electronic detonators to manage blast vibration and reduce impacts on residents

Cultural Heritage

- Received government approval for the Macleans Hill Aboriginal cultural heritage management plan
- Successfully salvaged artefacts in the Macleans Hill area prior to disturbance
- Recorded zero cultural heritage incidents

Air Quality

- Achieved 100 per cent compliance with air quality criteria
- Continued the use of dust suppressants on haul roads
- Commissioned two new water carts
- Submitted a revised air quality management plan to DoPI for approval
- Nominated as a finalist for a NSW Minerals Council Environment and Community Excellence Award and received a BHP Billiton Health, Safety, Environment and Community Award for dust management

Weather

- 824.8 millimetres of rainfall
- 79 rain days
- Temperature ranged between -0.4 to 41.5 degrees Celsius
- Dominant east south easterly winds

Flora and Fauna

- Completed the annual flora and fauna survey
- Completed the targeted *Diuris tricolor* survey
- Recorded the second highest number of *Diuris tricolor* plants present since monitoring began in 2007
- Complied with all flora and fauna requirements
- Established additional nesting boxes and fauna habitat within the site's offset areas
- Undertook further detailed vegetation mapping

Greenhouse Gas and Energy

- Continued to identify energy efficiency opportunities
- Submitted regulatory reports required under Energy Efficiency Opportunities and National Greenhouse and Energy Reporting
- Completed development of a greenhouse gas abatement cost curve

Land Management

- Commenced installation of perimeter fencing around Mt Arthur Coal
- Replaced perimeter fencing on a number of properties owned by Mt Arthur Coal
- Treated approximately 326 hectares for weeds
- Installed erosion and sediment control measures
- Collected native seed on site for use in rehabilitation and visual screening projects
- Continued wild dog management on land owned by Mt Arthur Coal in collaboration with neighbours

Train being loaded with coal at Mt Arthur Coal's rail loading facility

Noise

- Maintained noise levels below regulated limits
- Installed new sound attenuation equipment
- Integrated a new noise monitoring database
- Submitted a noise management plan to DoPI for approval

Rehabilitation and Tailings

- Rehabilitated 11.1 hectares of land
- Aerial seeded 165 hectares of overburden
- Developed and submitted a rehabilitation strategy for government approval
- Lodged an application for a tailings storage facility extension to DTIRIS for approval

Spontaneous Combustion

- Continued monitoring and reporting of affected areas
- Recorded only minor outbreaks
- Treated 2,646 square metres of spontaneous combustion outbreaks
- Established an action plan to treat spontaneous combustion in the Drayton sublease
- Commenced construction of a haul ramp to access and treat areas of spontaneous combustion

Visual Amenity and Lighting

- Implemented management plans for on-site lighting
- Purchased new light-emitting diode (LED) lighting plants
- Submitted a visual impact report to DoPI for approval

Waste Management

- Recycled 91 per cent of total waste from site
- Managed all waste on site through a total waste management system

Water Management

- Utilised rainfall runoff for approximately 75 per cent of water used on site
- Decreased total water consumption from the Hunter River by 35 per cent from the previous year

Community Relations

- Developed a five-year community investment plan
- Invested in sustainable initiatives through the Community Development Fund
- Delivered an Aboriginal engagement program in Muswellbrook and the surrounding region
- Facilitated a Housing and Homelessness workshop with representatives from the housing sector
- Received a commendation in the 2011 Planning Excellence Awards for the Sustainable Communities Project

Legal Compliance

- Maintained high levels of regulatory compliance during the year
- Received zero government fines and penalties
- Maintained international standards certification for the environmental management system
- Surrendered project approvals that were consolidated in September 2010
- Referred future operational areas under the *Federal Environment Protection and Biodiversity Conservation Act 1999*

2. Description of Operations

2.1 Overview

Hunter Valley Energy Coal Pty Ltd (HVEC), a wholly-owned subsidiary of BHP Billiton, operates the Mt Arthur Coal complex which includes consolidated open cut operations and the Mt Arthur Underground Project. The approved operational areas are shown in Figure 1.

Mt Arthur Coal is located south west of Muswellbrook in the NSW Upper Hunter Valley, within the proclaimed Muswellbrook Mine Subsidence District and the Muswellbrook Local Government Area (LGA) (see Figure 2).

Development within the Mt Arthur Coal complex commenced in the early 1960s in the Bayswater No. 2 open cut mining area. Coal production progressively increased and approval to extract coal from the Bayswater No. 3 open cut was granted in 1994. To support the expanding development at Bayswater No. 3 and cease coal transport by public road, approval was obtained in November 2000 for the construction and operation of the rail loading facility and spur line. This connects to the main northern railway line to allow export coal to be transported directly to the Port of Newcastle.

In May 2001, the Mt Arthur North open cut operation was approved to permit the annual extraction of up to 15 million tonnes of run-of-mine coal and the construction and use of associated infrastructure and facilities. Subsequent approvals were granted including the development of an exploration adit in 2006, an extension to the Mt Arthur North South Pit in January 2008 and the Mt Arthur Underground Project in December 2008.

To streamline the regulatory framework and ensure a consistent approach to environmental management across the approved areas, Mt Arthur Coal was granted approval for the consolidation of the open cut and surface facilities into a single, contemporary project approval in September 2010. The Mt Arthur Coal Mine Open Cut Consolidation Project Approval permits the extraction of up to 36 million tonnes of run-of-mine coal from the complex in a calendar year.

In accordance with the Mt Arthur Coal Mine Open Cut Consolidation Project Approval, a number of other project approvals were surrendered by Mt Arthur Coal in 2011 including for Mt Arthur North, the Rail Loading Facility and the South Pit Extension. The Bayswater No. 3 development consent is expected to be surrendered in 2012, resulting in two approvals for the complex: one for open cut and surface facilities and one for the underground project.

2.2 Existing Operations

Coal production from the open cut operation has been the focus at Mt Arthur Coal since 2002. Open cut coal mining at the site is conducted using shovels and excavators, supported by a fleet of haul trucks to transport the coal to the coal handling and preparation plant (CHPP) for processing. The mining process is discussed in section 2.2.2.

In 2011, 19.6 million tonnes of run-of-mine coal was mined from Mt Arthur Coal's open cut operations. Coal was mined from the Glen Munro seam to the Ramrod Creek seam within the Wittingham coal measures. Following processing on site, a total of 15.8 million tonnes of product coal was transported by rail to the Port of Newcastle for export, or by conveyor to the Bayswater Power Station.

Mt Arthur Coal did not undertake underground mining activities during 2011.

2.2.1 Coal Exploration

In 2011, Mt Arthur Coal conducted exploration drilling activities in mining leases 1358 and 1487 to further assess coal resources at the complex. During these activities 26 boreholes were drilled totalling 2,511 metres in depth.

Consistent with previous years, and in accordance with Environmental Management System (EMS) procedures, environmental aspects continued to be well managed in Mt Arthur Coal's exploration areas during 2011. Grouting of completed boreholes was signed off by the driller who completed the task and was checked by the supervising geologist prior to the grouting records being archived. Boreholes that are yet to be grouted or that require additional testing have been secured with borehole caps.

Environmental assessments were also conducted for each drill site prior to drilling commencing to minimise impacts. This included reviewing proposed drilling programs against the locations of known Aboriginal archaeological artefacts, conservation areas, remnant or mature native vegetation and other sensitive environmental features to minimise impacts as much as possible. This process has resulted in the relocation of some drill sites to prevent potential impacts.

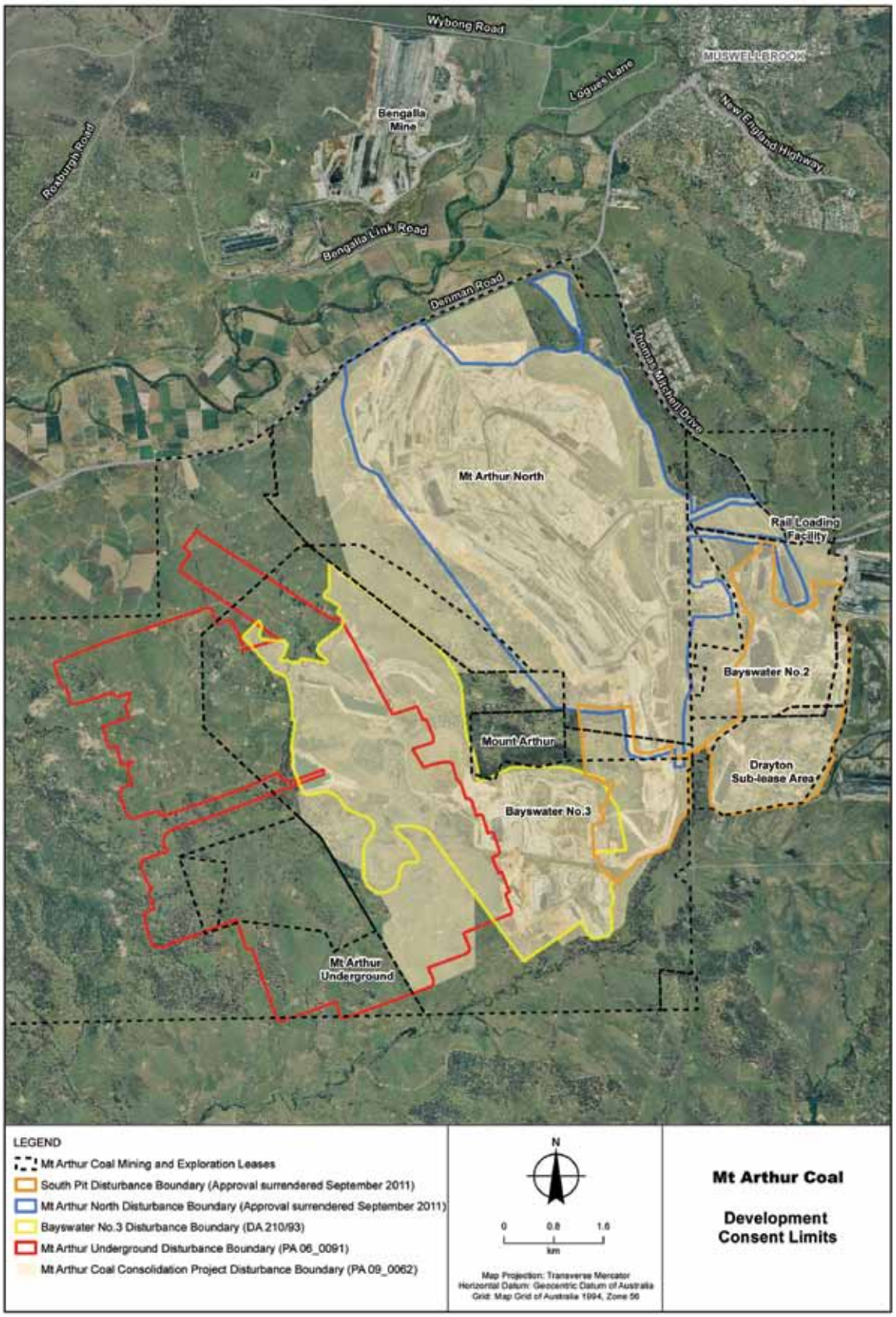


Figure 1: Location of the Mt Arthur Coal disturbance boundary

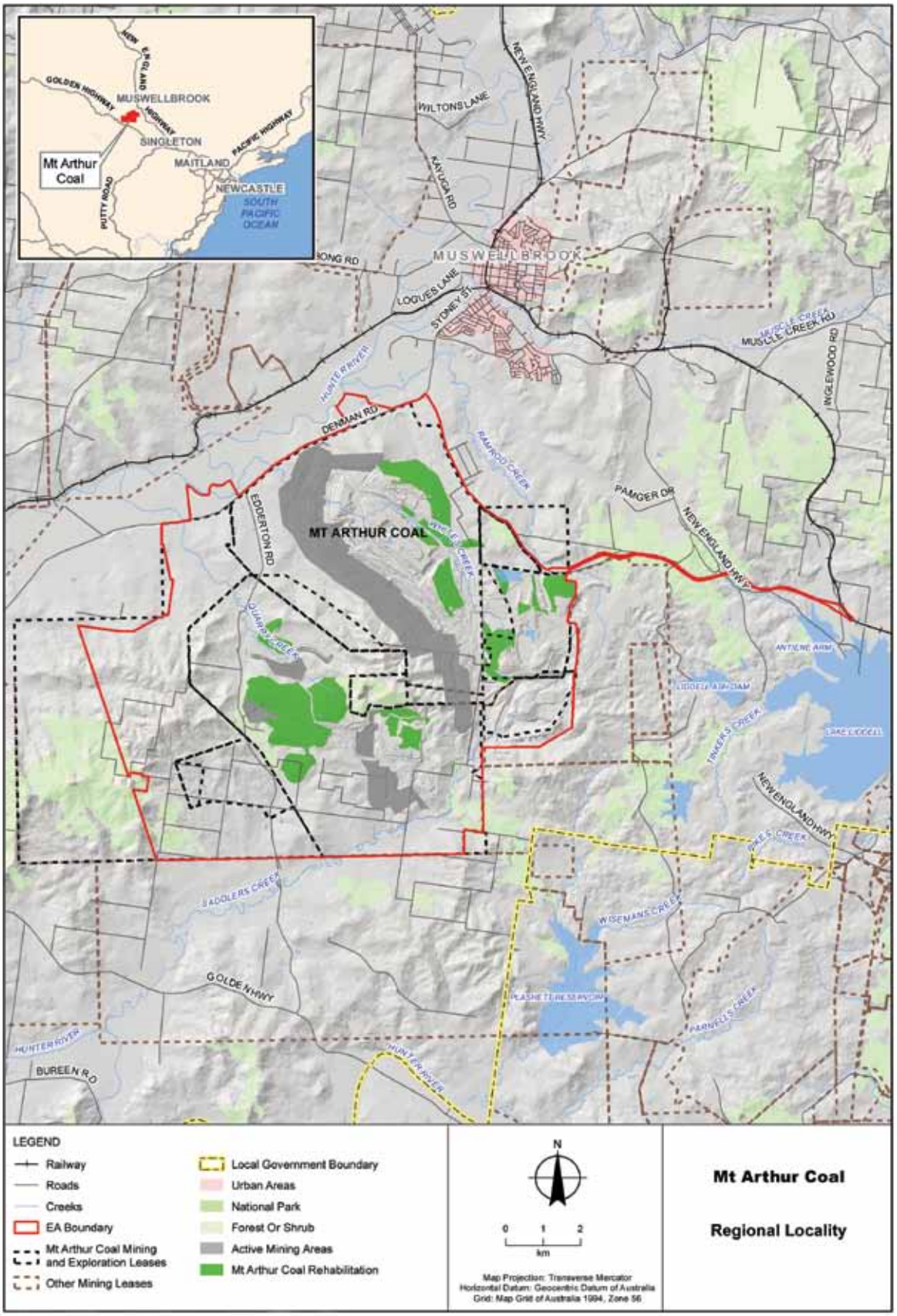


Figure 2: Location of Mt Arthur Coal

2.2.2 Coal Mining

Mining is undertaken by open cut methods using predominantly electric rope shovels, hydraulic excavators and haul trucks. The mining occurs in distinct stages that are described below and illustrated in Figure 3.

Environmental Assessment

Before mining can commence, a range of approvals from a number of government agencies, predominantly State authorities, must first be obtained. These approvals impose conditions on the operation to ensure original commitments are met and environmental and social impacts are managed to acceptable levels.

EMS procedures are subsequently developed and applied to the operation to meet and, where possible, exceed regulatory requirements. Environmental monitoring programs are established at this stage of development and initial environmental controls are put in place.

Land Preparation

The first stage of the physical mining process involves the removal of any existing vegetation. Most of the land disturbed for mining at Mt Arthur Coal is pastoral grassland that has been cleared by previous landowners.

Approximately 60 per cent of the land cleared for mining in 2011 contained either trees which had partly regrown from historical grazing or areas of remnant woodland.

Prior to felling, all large trees are inspected for the presence of fauna by a member of the Mt Arthur Coal Environment and Community team. Consistent with EMS procedures, tree felling is required to be delayed in some instances to enable the natural movement of fauna from these areas. Felling is also conducted outside of breeding seasons where possible.

Trees are felled in a controlled manner to minimise the likelihood of injury or death to fauna that could possibly be present, but were not detected during external inspections and observations. Any fauna found may be checked or relocated as required by a member of the Environment and Community team or local wildlife carers.

In 2011, cleared timber was not of a quantity or quality to justify commercial harvesting, although reuse options are generally assessed on an ongoing basis. Where possible large trees removed in advance of mining were mulched and incorporated into topsoil. Small pockets of juvenile and other trees unsuitable for mulching are buried within the active overburden emplacement areas. Hollows were recovered for nesting boxes and relocated to the offset area near North pit and the site's environmental dam. Timber was also salvaged for use as fence posts on site, with some logs donated to a local community group in Scone.

Topsoil Recovery

Topsoil is recovered using excavators, dozers and trucks or scrapers, and either placed directly onto reshaped areas or stockpiled. Soil qualities are variable across the site, but are generally poor and lacking in structure, nutrients and organic material. On average, between 200 to 300 millimetres of topsoil is recovered during stripping for reuse on rehabilitation areas. Once established, topsoil stockpiles are revegetated and recorded in the mine planning database.

Blasting

Holes are drilled into overburden and safely loaded with explosives. The overburden is then blasted to fracture the rock and enable more efficient removal of this material. Many controls are applied during blast design, drilling and firing to reduce the potential for impacts on the environment, buildings, powerlines and the community. Additional information on these controls can be found in section 3.1.3.

Overburden Removal

Hydraulic excavators and electric rope shovels remove and load blasted overburden into large haul trucks of nominal 328-tonne and 240-tonne capacities. These trucks transport the material to emplacement areas generally within the mine void. Overburden can also be used in the construction of visual bunds.

Coal Recovery

After removing the overburden above the coal seams the coal is mined using hydraulic excavators and loaders with the assistance of dozers. Haul trucks of nominal 180-tonne capacity then transport the coal to the CHPP for processing.

Coal Processing and Transport Off Site

After crushing to size and processing to remove impurities, coal is stockpiled prior to transport from site. Coal is then either conveyed to Bayswater Power Station or loaded onto trains for transport to the Port of Newcastle.

Consistent with Mt Arthur Coal's project approvals, no product coal was transported from site by public road in 2011 and all train movements were recorded (see Appendix 1).

Mined Land Rehabilitation

As overburden emplacement areas approach the final landform design, dozers are used to reshape the land to conform to the surrounding environment. This process takes into account the drainage and slopes as set out in the mining operations plan submitted and accepted by DTIRIS.

These reshaped areas are then re-topsoiled, ripped and sown with a mix of grasses and native trees. Completed rehabilitation areas are then inspected and maintained to ensure long-term rehabilitation objectives are achieved.

Overburden areas that are not at final landform design and will remain unused for six months or more are identified and, where feasible, seeded with quick growing pasture species to provide ground cover and minimise windblown dust generation.

Coal Product

Table 1 provides a summary of Mt Arthur Coal's coal production figures for 2011. During the year, 19.6 million tonnes of run-of-mine coal were mined from the combined open cut operations – a 30 per cent increase on production in 2010 – which resulted in 15.8 million tonnes of product coal. This increase in run-of-mine coal production is associated with the ongoing growth of Mt Arthur Coal.

Coal was mined from the Mt Arthur, Piercefield, Vaux, Broonie, Bayswater, Wynn, Bengalla, Warkworth, Edderton, Clanricard, Edinglassie, Transition, Ramrod Creek, Glen Munro, Woodlands Hill and Unnamed C seams within the Wittingham coal measures.

Table 1: Mine performance figures for 2011

Category	Unit	Quantity
Overburden	bcm	86,643,491
Run-of-mine coal mined	tonnes	19,595,213
Product (saleable) coal	tonnes	15,777,262
Washery reject	tonnes	4,303,646
Area newly disturbed	ha	240.1
Area redisturbed	ha	0.0
Topsoil stripped	m^3	720,300
Topsoil used/spread	m^3	33,300
Area of overburden aerial seeded	ha	165
Area rehabilitated (gross)	ha	11.1
Area rehabilitated (net)	ha	11.1
Employment level (permanent)	persons	1,282

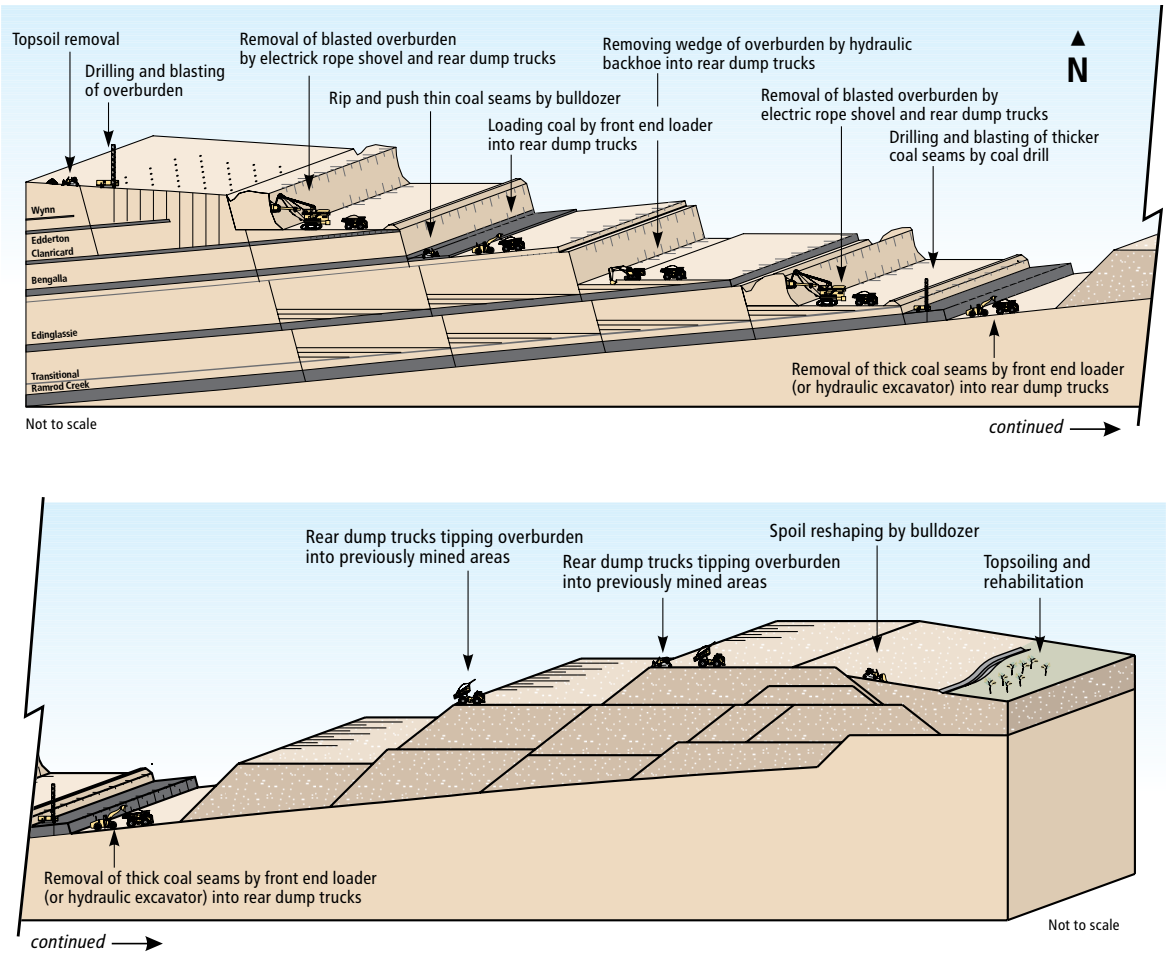


Figure 3: Mining sequence from topsoil removal to rehabilitation

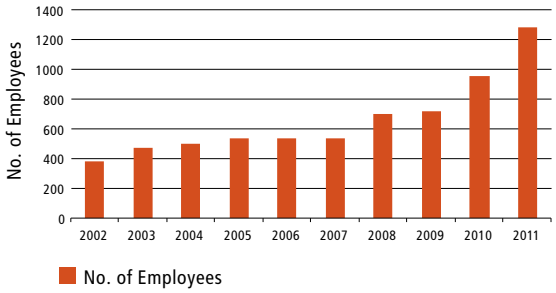


Figure 4: Mt Arthur Coal employee numbers from 2002 to 2011

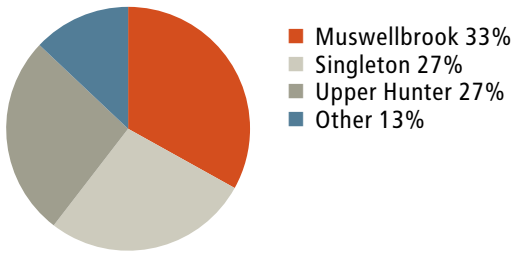


Figure 5: Residential location of Mt Arthur Coal employees as at 31 December 2011

Coal Transport

Mt Arthur Coal complied with all project approval requirements relating to limits on transportation of coal in 2011.

During the year, 14.2 million tonnes of export product coal were transported by rail to the Port of Newcastle (see Appendix 1) and 1.5 million tonnes by conveyor to the Bayswater Power Station. The amount of coal sold at Mt Arthur Coal in 2011 exceeded the amount of coal produced by 38,734 tonnes. Coal sold in 2011 was sourced from run-of-mine coal produced in 2011 and coal stockpiled from previous years.

The total number of train movements in 2011 was 3,974 and the highest number of train movements on one day was 21 on 4 April, 15 June and 23 July 2011.

2.2.3 Employment Levels

At the end of 2011, Mt Arthur Coal employed 1,282 full-time permanent employees and approximately 760 contractors on a full-time equivalent basis. This was a 33.5 per cent increase in the number of permanent employees when compared to 2010 and was attributed to the ongoing growth of Mt Arthur Coal (see Figure 4).

Local residency is one of the factors considered when recruiting new employees and contractors. This approach ensures that local communities benefit from Mt Arthur Coal's operations. As shown in Figure 5, approximately 87 per cent of Mt Arthur Coal's employees resided in the local government areas of Muswellbrook, Singleton and the Upper Hunter at the end of 2011. This is consistent with predictions in the Mt Arthur Coal Consolidation Project Environmental Assessment and aligns with commitments made in the project approval.

It also remains relatively consistent with historical employment patterns and demonstrates Mt Arthur Coal's commitment to employing local people where possible during growth projects.

2.3 New Mining Projects

As open cut mining increases in line with existing approvals, Mt Arthur Coal is investigating opportunities to increase the flexibility of mining methods in response to market demands and to maximise economic coal recovery from available reserves in its existing mining title areas. This approach is in addition to implementing already approved increases in open cut mining at the site.

2.3.1 Mt Arthur Coal Modification Project

The consolidation of all of its open cut approvals into a single project approval (PA 09_0062) in 2010 has enabled Mt Arthur Coal to develop a more cohesive approach to regulatory compliance and increased the efficacy of its environmental management programs.

Since the approval was granted, Mt Arthur Coal has undertaken further detailed mine and infrastructure planning which has identified opportunities to further improve the mine's operational efficiency and its flexibility to respond to changing market needs. To ensure these opportunities for further improvement receive appropriate NSW Government approval, Mt Arthur Coal is planning to apply for a modification to the Mt Arthur Coal Mine Open Cut Consolidation Project Approval under Section 75W of the *Environmental Planning and Assessment Act 1979* in mid-2012.

The modification will enable the continuation of all aspects of Mt Arthur Coal's activities as approved under the existing project approval without increasing Mt Arthur Coal's annual coal production or export limits. It will also not significantly increase the already approved environmental footprint of the Mt Arthur Coal operation.

As part of the modification project, Mt Arthur Coal is proposing to:

- extend the life of the open cut mine by four years from 2022 to 2026 at the currently approved maximum production level of 32 million tonnes per annum;
- place overburden in an area central to the mine and relocate existing infrastructure;
- increase the area used for the mine's open cut operations, including overburden emplacement, by approximately 400 hectares;
- construct a second rail line on the existing Mt Arthur Coal rail loop;
- increase the daily maximum number of trains from 12 to 19 without increasing the annual total tonnage of coal transported by train from Mt Arthur Coal (this results in a change from 24 to 38 movements per day);
- relocate the loading point for the overland conveyor which supplies coal to Macquarie Generation's Bayswater Power Station;
- relocate and upgrade the site's explosives storage facility;
- construct additional administration buildings, and a control room;
- undertake a small footprint extension to the run-of-mine stockpile without increasing the stockpile's total capacity.

Mt Arthur Coal has commenced the preparation of an environmental assessment (EA) for the modification project and will undertake a comprehensive community and stakeholder engagement program to ensure any potential social impacts associated with the proposal are identified and where possible addressed through appropriate mitigation measures.

The EA is expected to be lodged with the DoPI in mid-2012, with the project approval likely to take approximately 12 months to complete.

2.4 Environmental Management

Mt Arthur Coal is committed to delivering the highest standards of environmental performance to meet or exceed legal and other requirements. This commitment extends to using leading practice initiatives to minimise the impact of our operations on the environment and community.

2.4.1 Environment and Community Team

Mt Arthur Coal has an Environment and Community team committed to managing and overseeing implementation of the EMS and related programs. The team continues to maintain effective professional relationships with key stakeholders, including government agencies, NGOs, the local community, other mines and employees.

Excavator loading coal at Mt Arthur Coal's Windmill Pit

In 2011, there were a number of important changes to the personnel and roles in the team. The team welcomed Nicole Wergeltoft-Grant as Community Relations Coordinator, Donna McLaughlin as Environmental Coordinator and Michael Gale as Environmental Superintendent. Michael replaced Steve Perkins, who completed his secondment and returned to New Mexico Coal in late 2011.

Contact details for Mt Arthur Coal's General Manager and Environment and Community team can be found in Table 2.

Table 2: Mt Arthur Coal General Manager and Environment and Community Team contact details

Name and role	Contact details
Michael White *General Manager*	Ph 02 6544 5800 Fax 02 6544 5801
Julie McNaughton *Environmental and Community Manager*	Ph 02 6544 5840
Michael Gale *Environmental Superintendent*	Ph 02 6544 5874
Scott Mitchell *Environmental Superintendent*	Ph 02 6544 5874
Rebecca Smith *Environmental Coordinator*	Ph 02 6544 5880
Donna McLaughlin *Environmental Coordinator*	Ph 02 6544 5880
Shelley Masterson *Community Relations Superintendent*	Ph 02 6544 5832
Nicole Wergeltoft-Grant *Community Relations Coordinator*	Ph 02 6544 5994

2.4.2 Legal Requirements

Mt Arthur Coal has a large number of statutory approvals that regulate activities on site. Each of these approvals has conditions which are derived from a range of aspects including the nature and size of the operation, diversity and sensitivities of local land use and the environment, the existing cumulative level of impact from mining and other industries, close proximity to large residential areas, and the comprehensive regulatory approvals process in NSW.

Mt Arthur Coal received no environmental fines or penalties from government authorities in 2011. Further information about Mt Arthur Coal's compliance with its legal requirements is included in Section 5. Table 3 lists the AEMR requirements for the Mt Arthur Coal Mine Open Cut Consolidation Project Approval.

Table 3: AEMR requirements for the Mt Arthur Coal Mine Open Cut Consolidation Project Approval

Project approval reference	Condition	AEMR section
Schedule 3, Condition 8	The Proponent shall: a. implement best noise management practice, which includes implementing all reasonable and feasible noise mitigation measures; b. ensure that the real-time noise monitoring and meteorological forecasting data are assessed regularly, and that mining operations are relocated, modified and/or suspended to ensure compliance with the relevant conditions of this approval; and c. regularly investigate ways to reduce the operational, low frequency, rail and road traffic noise generated by the project, and report on these investigations in the annual review (see condition 3 of schedule 5), to the satisfaction of the Director-General.	3.8.3
Schedule 3, Condition 53	The Proponent shall: a. minimise and monitor the waste generated by the project; b. ensure that the waste generated by the project is appropriately stored, handled and disposed of; c. manage on-site sewage treatment and disposal in accordance with the requirements of Council; and d. report on waste management and minimisation in the Annual Review, to the satisfaction of the Director-General.	3.12
Schedule 5, Condition 3	By the end of 2010, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must: a. describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year; b. include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the: • the relevant statutory requirements, limits or performance measures/criteria; • the monitoring results of previous years; and • the relevant predictions in the EA; c. identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; d. identify any trends in the monitoring data over the life of the project; e. identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and f. describe what measures will be implemented over the next year to improve the environmental performance of the project.	3
Appendix 3, Condition 11	Water at Mt Arthur Coal will continue to be managed in accordance with best practice and the reduce, reuse, recycle principles. Development of modern tailings storage facilities and possible modifications to coal preparation processes to reduce water usage on site will continue to be developed and assessed, and water use and reduction initiatives will be reported annually in the Annual Review.	3.13.3
Appendix 3, Condition 27	Mt Arthur Coal will monitor the proportion of its additional employees ('new employees' needed for the Consolidation Project that are recruited from outside the local area (defined as Muswellbrook, Upper Hunter and Singleton Local Government Areas) and will report on this in its Annual Reviews for the Project. If the proportion of employees recruited from outside the local area excessively differs from the 20 per cent level forecast in the EA, that is 30 per cent or above in-migrant new employees in any one calendar year, Mt Arthur Coal will review its recruitment program to encourage greater local recruitment and will publish in its next Annual Review the measure it proposes to adopt to achieve this including the timeframe for their implementation and how their effectiveness would be monitored.	3.13.3

2.4.3 New Government Approvals and Changes to Existing Government Approvals

Mining Leases

On 3 March 2011, mining lease 1655 granted by DTIRIS was converted from part A171. In 2010, applications for renewal of mining purpose lease (MPL) 263 and exploration licence A171 were submitted to DTIRIS. The MPL 263 draft conditions were received in October 2011 and the renewal is expected in early 2012. The renewal of exploration licence (EL) A171 is still pending. An application for the renewal of EL 5965 will be submitted in mid-2012.

Project Approvals

On 7 November 2011, DoPI accepted the surrender of the following project approvals and development consents as required by the Mt Arthur Coal Mine Open Cut Consolidation Project Approval:

- DA 105-04-00 Construction of the Rail Loading Facility and Rail Loop;
- DA 14-05-2000 Mt Arthur North Mine;
- DA 24/97 Bayswater Coal Preparation Plant;
- PA 06_0108 Mt Arthur Coal Mine South Pit Extension.

The granting of the consolidated project approval enables improved compliance management and streamlined internal and external auditing with a focus on implementing practical improvement recommendations.

Approval was also granted for the surrender of DA 210/93 Bayswater No. 3 to be postponed until the Mt Arthur Coal Consolidation Project has been determined under the *Environment Protection and Biodiversity Conservation Act 1999*.

PA 06_0040 Exploration Adit, granted for a period of five years, expired on the 20 September 2011.

Environment Protection Licence

The Mt Arthur Coal Environment Protection Licence (EPL 11457) was varied on 8 August 2011 to include the Coal Mine Particulate Matter Control Best Practice Pollution Reduction Program. This requires Mt Arthur Coal to prepare a report on the practicality of implementing best practice measures to reduce particle emissions.

Environment Protection and Biodiversity Conservation Act Approvals

The Environment Protection and Biodiversity Conservation (EPBC) Act is federal legislation administered by the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) that protects nationally significant flora, fauna and ecological communities.

In February 2011, Mt Arthur Coal voluntarily lodged a referral under the EPBC Act for areas approved under state planning legislation. The referral was placed on public display during February and March 2011 and received no comments. SEWPAC determined the project to be a controlled action to be assessed through preliminary documentation. Preliminary documentation was prepared by Mt Arthur Coal and lodged with SEWPAC in November 2011. The preliminary documentation will be placed on public exhibition in January 2012 before undergoing assessment by SEWPAC.

Kimberly Ohmsen, Dispatcher

Table 4: Mt Arthur Coal's existing statutory approvals as at 31 December 2011

Description	Issue date	Expiry date
Development consents and planning approvals issued by the NSW Department of Planning and Infrastructure		
Bayswater No. 3[1]	12/09/94	11/09/15
Mt Arthur Underground	02/12/08	31/12/30
Mt Arthur Coal Mine Open Cut Consolidation Project	24/09/10	30/06/22
Environment protection licence issued by the Environmental Protection Authority		
EPL 11457	09/10/01 (last updated on 8/8/11)	Not specified
Mining leases and exploration licences issued by the Department of Trade and Investment, Regional Infrastructure and Services		
A 171	18/10/79	*
CCL 744	03/07/89	21/01/28
MPL 263	17/10/90	**
CL 396	03/06/92	03/02/24
A 437	04/03/91	04/03/15
ML 1358	21/09/94	20/09/15
EL 5965	15/07/02	14/07/12
ML 1593	30/04/07	29/04/28
ML 1487	13/06/01	12/06/22
ML 1548	31/05/04	30/05/25
ML 1655	03/03/11	03/03/32

[1] *Approval granted by DoPI for the surrender of consent to be postponed until a determination under the EPBC Act has been made on the Mt Arthur Coal Consolidation Project.*

* *Application for renewal of an exploration licence has been submitted to DTIRIS.*

** *Application for renewal of a mining purpose lease has been submitted to DTIRIS. Draft conditions have been received and renewal is pending.*

2.4.4 BHP Billiton Requirements

As part of the global mining company BHP Billiton, Mt Arthur Coal must comply with a diverse range of organisational policies, management standards, objectives and targets. These requirements are designed to ensure a consistently high standard of environmental and social performance is achieved across BHP Billiton-owned operations worldwide.

The BHP Billiton operating model is based on the principles of simplicity, accountability and effectiveness. The main documents outlining the company's commitment to health, safety, environment and community principles and practices are the BHP Billiton Charter and Mt Arthur Coal's Sustainable Development Policy, which recognises the unique social and environmental contexts within which the mine operates (see Appendix 2).

Mt Arthur Coal produced monthly environment and community reports during 2011. These reports contain environmental and social performance data which is benchmarked against data from other BHP Billiton sites and included in public reports. Mt Arthur Coal's achievements in environmental management and community engagement continue to comply with BHP Billiton standards.

2.4.5 Mt Arthur Coal Environmental Management System

Mt Arthur Coal has implemented a comprehensive EMS that provides a framework to manage compliance with relevant legislation, statutory approvals, organisational objectives and community expectations. The EMS is certified against ISO14001, which is the benchmark international standard for development, implementation, continual review and improvement of an EMS.

The EMS is based on a 'plan, do, check, act' cycle and encourages continual improvements in performance. It uses a suite of procedures for key activities that have the potential to generate environmental and social impacts. These procedures are continually reviewed, communicated to employees and audited for compliance.

To maintain certification to international standards, Mt Arthur Coal is subject to annual surveillance audits and three yearly recertification audits. An annual surveillance audit was undertaken in June 2011 by Det Norske Veritas,an independent risk management company, to determine the degree of conformity and effectiveness of the system against the certification criteria. The audit identified:

- three minor non-conformances in the areas of emergency preparedness and response and operational control;
- four observations in the areas of operational control, competence, training and awareness, incident management and monitoring and measurement;
- two opportunities for improvement in the areas of communication and monitoring and measurement;
- one noteworthy effort in the area of the internal audit.

Overall the audit showed that the EMS was in compliance with the criteria and certification was retained. Mt Arthur Coal implemented actions in 2011 to address the three minor non-conformances identified during the surveillance audit.

3. Environmental Performance

3.1 Blasting

2011 Summary

- Fired 127 blasts
- Effectively managed blasts to comply with regulatory limits at all monitoring sites
- Submitted a revised blast management plan to DoPI for approval
- Postponed 104 blasts due to unfavourable weather conditions to reduce impacts on residents
- Continued use of electronic detonators to manage blast vibration and reduce impacts on residents

Blasting of mine overburden to allow efficient recovery of the underlying coal can have impacts on the surrounding community. These impacts include vibrations through the air (overpressure) and earth (ground vibration), as well as dust and fume generated from the blast.

Overpressure and ground vibration limits in place for private residences and heritage structures are prescribed by government and based on Australian and international standards. Blasts are designed and managed to minimise the risk of exceeding these limits, and data from blast monitors located around the mine are compared and reported against these criteria.

3.1.1 Monitoring Systems

Mt Arthur Coal has an approved blast monitoring system that includes six blast monitors. The locations of these monitors have been determined in consultation with government agencies and include private residences and other blast sensitive areas, as shown in Figure 6.

During the year, all blast monitors were calibrated in accordance with relevant Australian standards by a National Association of Testing Authorities (NATA) accredited laboratory. Blast monitoring results were reported to government agencies, CCCs and provided upon request to local residents and complainants.

Prior to each blast, a pre-blast environmental assessment was carried out to gauge the severity of the possible impacts on the surrounding community and the environment. The assessment includes a review of wind speed and direction, the strength of temperature inversions (if present) and the location and size of the blast. A new secondary inversion modelling tool was also implemented during the year to assist pre-blast assessments. In 2011, 104 blasts were postponed following pre-blast assessments due to unfavourable environmental conditions that had the potential to result in negative impacts on the surrounding community.

Mt Arthur Coal consults surrounding mines regarding scheduled blast times to avoid multiple blasts being fired at the same time, and advises near-neighbours by phone and letter.

3.1.2 Results

A total of 127 blasts were fired at Mt Arthur Coal during 2011, and the results of these are shown in Appendix 3.

The average overpressure recorded at licensed monitoring sites was 95.4 decibels (linear), with the highest overpressure result of 120 (linear) recorded on 7 July 2011 at Sheppard Avenue (see location BP07 in Figure 6). The average ground vibration recorded at licensed monitoring sites was 0.49 millimetres per second (mm/s), with the highest ground vibration result 8.58 mm/s recorded on 17 January 2011 at Denman Road West (see location BP09 in Figure 6).

Under the Mt Arthur Coal Mine Open Cut Consolidation Project Approval 09_0062, ground vibration is limited to 10 mm/s and overpressure noise limited to 133 decibels (linear) at BP08.

At all other sensitive receptors, ground vibration is limited to 10 mm/s and overpressure noise is limited to 120 decibels (linear). Ground vibration and overpressure are also limited to 5 mm/s and 115 decibels (linear) respectively for 95 per cent of blasts at all sites except BP08. All of Mt Arthur Coal's monitoring results in 2011 were within development consent requirements for overpressure and ground vibration.

The Mt Arthur Coal Edinglassie monitor (BP08) recorded a ground vibration in excess of 10 mm/s on 17 February 2011 and 15.67 mm/s on 23 March 2011. These results were in excess of the 10 mm/s limit specified by the Mt Arthur Coal Mine Open Cut Consolidation Project Approval at this location and were reported to DoPI. The resulting inspection found that the geophone at the Edinglassie blast monitor had detached from its concrete block, rendering these results invalid.

Blast vibration results recorded at a monitor 130 metres from BP08, and used by a neighbouring mine, were provided to Mt Arthur Coal. The results at this monitor were 5.72 mm/s on 17 February and 5.29 mm/s on 23 March. These results more accurately reflect the blast vibration at the Edinglassie homestead and have been used to replace the results recorded by the detached geophone shown in Mt Arthur Coal's blast monitoring records.

Mt Arthur Coal immediately replaced the geophones on all monitors with an updated model that is bolted, rather than glued, to its concrete base to prevent a reoccurrence of this issue. Scheduled maintenance reports were also implemented by the blast monitoring contractor for the maintenance and inspection of blast monitoring equipment. DoPI was immediately notified of the issue and the steps taken by Mt Arthur Coal to prevent its reoccurrence and acknowledged that these incidents were not a breach of consent conditions.

On 14 October 2011, a blast at Mt Arthur Coal generated blast fume which travelled off site. Following an investigation, the blast approval process at Mt Arthur Coal was reviewed and modified to mitigate the risk of a reoccurrence. The incident was immediately reported to DoPI and the Office of Environment and Heritage (OEH).

Mt Arthur Coal received no fines or penalties for blasting activities in 2011.

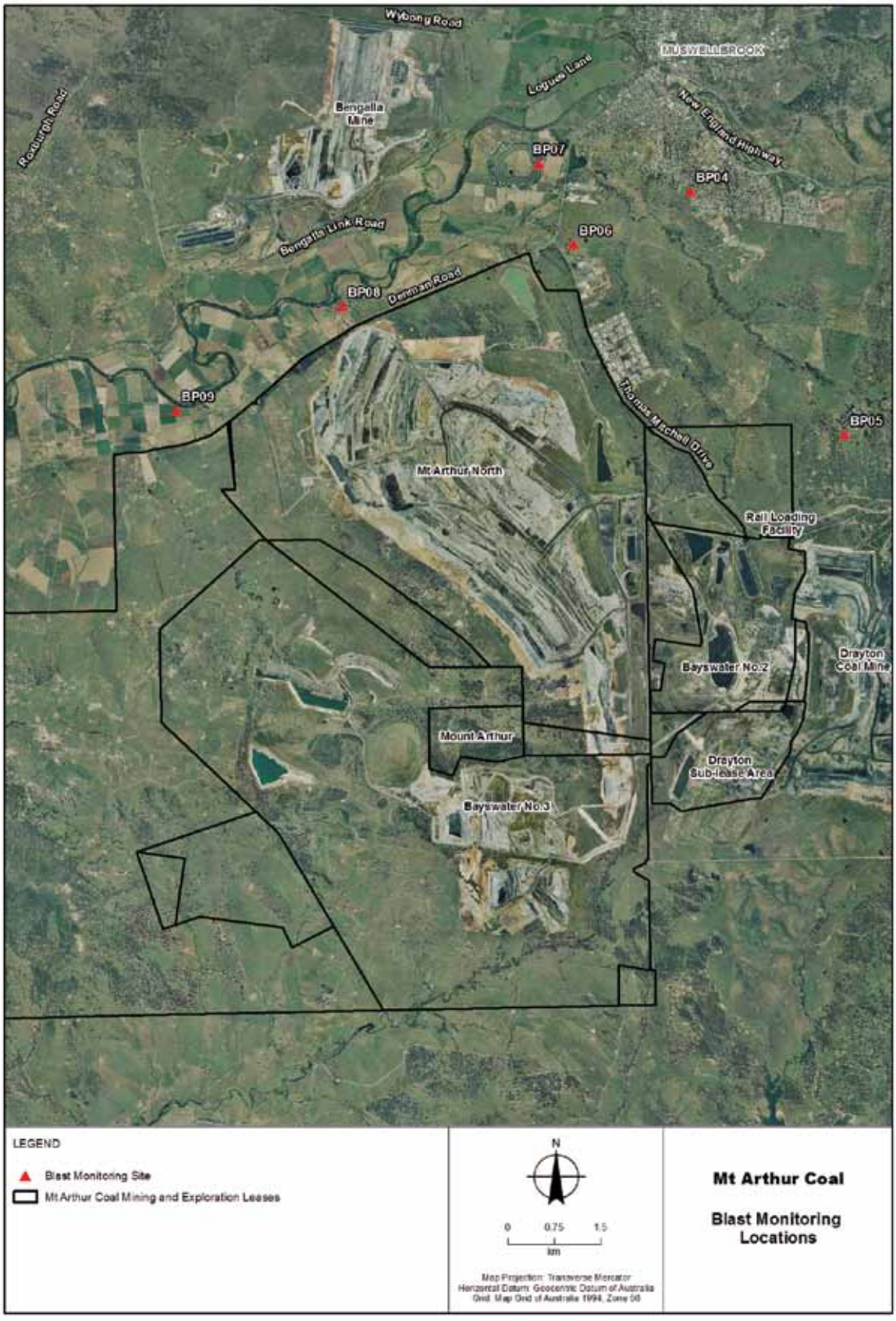


Figure 6: Mt Arthur Coal's blast monitoring locations

3.1.3 Management

Mt Arthur Coal has implemented a blast management plan that prescribes the system for blast monitoring, assessment, mitigation measures, remedial actions and reporting. Blasting activities at the mine are carefully managed in accordance with the management plan to minimise the potential for impacts on the neighbouring community and sensitive structures such as heritage buildings.

A government-approved management plan also exists for road closures when blasts are fired within 500 metres of a public road. Due to the location of blasting activities in 2011 this only applied to Denman Road, which was closed on 12 occasions during the year. Mt Arthur Coal's implementation of the management plan in 2011 effectively ensured the safety of road users, and no repairs were required to roads due to damage from blasting.

Mt Arthur Coal is committed to reducing the impacts of blasting on the community and its near-neighbours by implementing a range of mitigation measures, many of which exceed statutory requirements. Some of the measures undertaken during 2011 to reduce blasting impacts included:

- modelling potential impacts prior to blasting;
- using appropriate stemming material in the blast hole;
- controlling blast charges;
- undertaking pre-blasting environmental assessments;
- assessing the risk of fume for each blast;
- verifying that the monitors are working prior to each blast;
- notifying other mines and nearest residents of proposed blast times;
- extensively using electronic initiation systems to manage vibration;
- advertising planned blast times on the Mt Arthur Coal website;
- delaying blasts where weather conditions represented an unacceptable risk of off-site impacts;
- modifying blasting methods to ensure compliance with environmental limits;
- undertaking periodic structural inspections of blast-sensitive structures;
- trialing new blast techniques using a crush zone protection design.

The Hunter Valley Meteorological Sounding Group Joint Venture was formed in 2007 to operate equipment that provides real-time meteorological data, such as wind velocity and temperature, at 30 metre intervals up to 600 metres above the ground. This data is used as part of Mt Arthur Coal's pre-blast environmental assessment to predict the effects of atmospheric variations on air blast overpressure (measured as decibels (linear)) and environmental noise (measured as decibels (A-weighted)) and minimise any adverse impacts on the community.

The data can also be used to mitigate other environmental effects such as dust generation and gaseous emissions. Additional modelling software was also implemented during the year to forecast the risk of overpressure enhancement, which included assessing predicted overpressure at neighbouring sensitive receptors.

In August 2010, electronic detonators were introduced at Mt Arthur Coal to manage blast vibration. Electronic detonators accurately control timing delays between blasts to increase rock fragmentation, reduce vibration levels and decrease the potential of fly-rock. Electronic detonators continue to be used in areas where specific vibration issues need to be managed, in particular in the north of the operation.

Mt Arthur Coal received 41 blast complaints in 2011 which accounted for 45 per cent of all complaints received, and was an increase on the previous year. During 2011, consistent with the EA, there was increased blasting activity in the northern end of the mine, closest to neighbouring residents, which accounts for the increase in the number of complaints related to vibration, dust and fume impacts from blasting activities.

Mt Arthur Coal's Environment and Community team utilises a standard list of questions to assist in determining the impacts of the blast being experienced by a complainant and to implement appropriate controls to minimise the impact of future blasts.

3.2 Cultural Heritage

2011 Summary

- Received government approval for the Macleans Hill Aboriginal cultural heritage management plan
- Successfully salvaged artefacts in the Macleans Hill area prior to disturbance
- Recorded zero cultural heritage incidents

Mt Arthur Coal operates within an area that is rich in both Indigenous and non-Indigenous cultural heritage. Through its cultural heritage program Mt Arthur Coal assesses and manages significant heritage features that occur on its land. Mt Arthur Coal has implemented management plans that provide the framework to identify, assess, monitor, conserve and manage cultural heritage.

3.2.1 Indigenous Cultural Heritage

In January 2011, DoPI approved a cultural heritage management plan for the Macleans Hill area, which was approved for disturbance under the Mt Arthur Coal Mine Open Cut Consolidation Project Approval in September 2010. In line with the management plan, salvage works were undertaken at the site by 22 stakeholders representing a broad range of the Aboriginal community. In total, 306 artefacts were collected during the salvage works which were undertaken safely and without incident.

View of surrounding landscape from Macleans Hill

Additional ground surveys were undertaken by registered archaeologists as a due diligence measure and to verify historical salvages across a number of pre-strip areas, including Saddlers Pit and ahead of Huon and Windmill pits, as well as in areas proposed for exploration drilling works.

In June 2011, Mt Arthur Coal met with Aboriginal stakeholders to discuss the operation's cultural heritage and land management activities. Mt Arthur Coal received input from the stakeholders to better understand community expectations regarding a Keeping Place, training and employment, and community involvement mechanisms, such as an Aboriginal committee or working group.

3.2.2 Non-Indigenous (European) Cultural Heritage

In 2011, a European heritage management plan was submitted to DoPI for approval. During the year, items of European heritage significance, including homesteads and associated outbuildings located on land owned by Mt Arthur Coal, were managed in accordance with the management plan's objectives.

During 2011, Mt Arthur Coal inspected all of its historic homesteads and related buildings located on freehold land to ensure properties were maintained to an acceptable standard. Maintenance measures included painting, fencing repairs, pest control, waste water management, lawn and garden maintenance, drainage improvement and minor structural repairs. Two of the four heritage-listed homesteads continue to be tenanted as part of the strategy to preserve the condition and ensure security and ongoing maintenance of these valued structures.

Conservation management plans for Edinglassie and Rous Lench homesteads were undertaken in 2011 and will be lodged with DoPI for approval in early 2012. The Beer Homestead was approved for relocation under the Mt Arthur Coal Mine Open Cut Consolidation Project Approval, and a detailed plan for the relocation will be completed in 2012.

Mt Arthur Coal received no fines or penalties regarding cultural heritage in 2011.

3.3 Air Quality

2011 Summary

- Achieved 100 per cent compliance with air quality criteria
- Continued the use of dust suppressants on haul roads
- Commissioned two new water carts
- Submitted a revised air quality management plan to DoPI for approval
- Nominated as a finalist for a NSW Minerals Council Environment and Community Excellence Award and received a BHP Billiton Health, Safety, Environment and Community Award for dust management

Given the nature and scale of mining activities and the close proximity of Mt Arthur Coal to the local community, air quality is an important management issue. Similar to noise, dust can be derived from a number of mining and non-mining sources, and Mt Arthur Coal uses an air quality management system to monitor and respond to dust conditions.

3.3.1 Monitoring Systems

Dust management at Mt Arthur Coal involves the integration of operational procedures, alarming systems and an extensive monitoring network. The practical use of the modular global positioning system (GPS) for equipment tracking has proved to be an important tool for tracking the location of mining equipment and cross referencing with real-time meteorological data to assist with dust controls.

The dust monitoring network consists of a number of depositional dust gauges, fine particle monitors running on a set schedule and real-time fine particle monitors that operate continuously. The coupling of operational procedures and monitoring allows Mt Arthur Coal to take a proactive approach to dust management.

Depositional dust monitoring is carried out in accordance with Australian Standard 3580.10.1:2003. Depositional dust samples are collected on a monthly basis from 21 depositional dust gauges surrounding the Mt Arthur Coal complex (see Figure 7). Depositional dust can be derived from a number of mining and non-mining sources and does not indicate the source of the dust. However, dust deposition is useful as a broad measure of changing air quality.

Fine dust particles (i.e. less than 10 microns in size and referred to as PM_{10}) are monitored using high volume air samplers (HVAS) fitted with a size selective inlet. These monitors operate for 24-hours every six days in accordance with Australian Standard 3580.9.6:2003. A total of eight HVAS units are situated around the site as shown in Figure 7.

In addition to the HVAS monitors, six real-time dust monitors, referred to as tapered element oscillating microbalance samplers (TEOMs), are used to record PM_{10} levels on a continuous basis. The locations of the TEOMs at Mt Arthur Coal are shown in Figure 7. Two additional TEOMs will be added to the system in 2012 at the east and south of the operation.

Throughout 2011, dust monitoring results were regularly reported to government agencies and CCCs.

Data capture rates during 2011 for all air quality monitors are shown in Table 5. Incidents where data capture rates fell below 100 per cent were investigated and reported to the OEH as part of the EPL annual return. A further explanation of data capture rates is provided in section 3.3.2.

Mt Arthur Coal remains a signatory to the Upper Hunter Air Quality Monitoring Network, which was established in 2010 by the NSW Government in partnership with the coal and power industries. The network now continuously measures dust particulates in the air at up to 14 sites throughout the region. The collected data is provided to the community and industry through the OEH website.

Table 5: Air quality monitoring instrument data capture rates for 2011

Instrument	Data capture rate (%)
Depositional dust gauges	99
PM_{10} high volume air samplers	99
PM_{10} real-time dust monitors (TEOM)	94

3.3.2 Results

All air quality samples were collected by independent consultants and analysed by NATA certified laboratories in accordance with statutory requirements and relevant standards. All monitoring equipment is also maintained in accordance with the manufacturer's specifications.

Air quality impact assessment criteria is based on OEH's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* and specified in Mt Arthur Coal's development consents. A compilation of depositional dust results, HVAS PM_{10} monitoring data and a summary of real-time PM_{10} monitoring data is provided in Appendix 4.

Depositional Dust Gauges

The criterion for the maximum total deposited dust level is 4 grams per square metre per month ($g/m^2/mth$) over an annual averaging period. The maximum increase in deposited dust levels due to Mt Arthur Coal's operations over an annual averaging period at any one dust gauge is 2 $g/m^2/mth$.

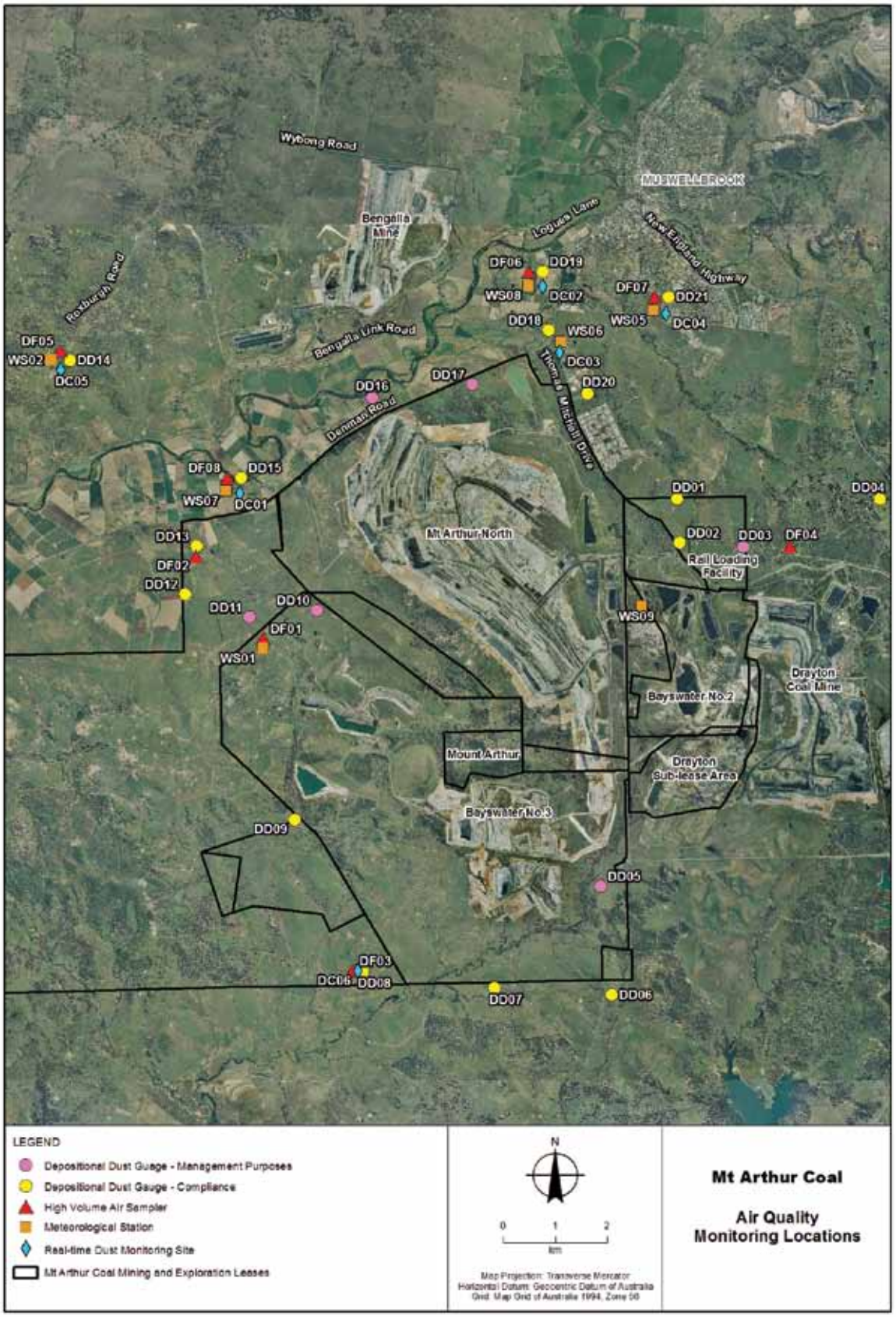
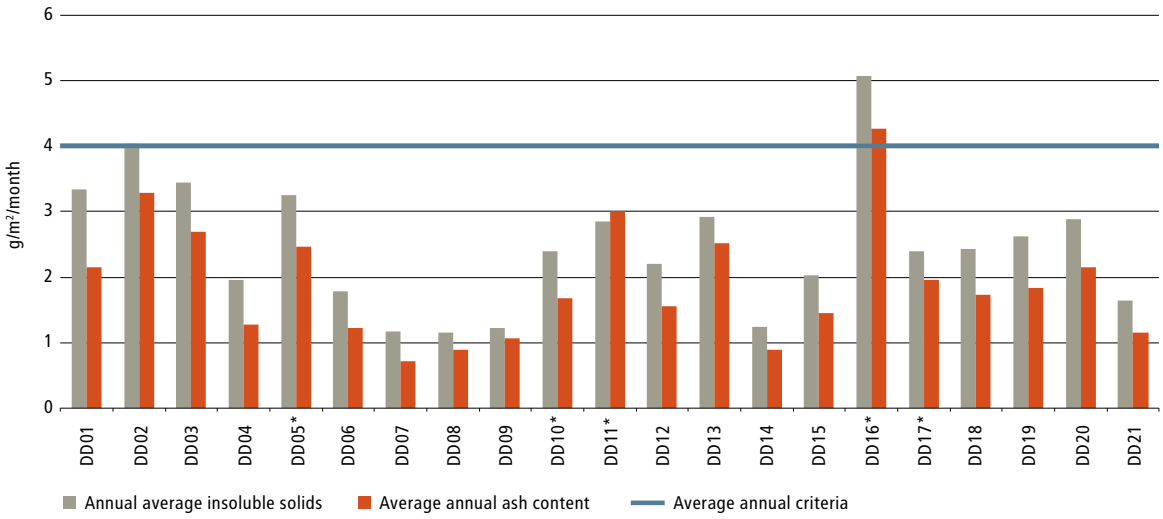


Figure 7: Mt Arthur Coal's air quality monitoring locations



** Depositional dust gauge is located on land owned by Mt Arthur Coal and is used for management purposes only.*

Figure 8: Mt Arthur Coal's depositional dust gauge annual averages for 2011

Figure 8 shows the annual average dust deposition for all dust gauges in 2011. Figure 9 uses dust isopleths from Mt Arthur Coal's monitoring sites to illustrate the depositional dust profile surrounding the mine. It is important to note that this figure only uses Mt Arthur Coal data and not data from other dust monitoring sources. Mt Arthur Coal undertakes monitoring on a monthly basis to assist in site management, however compliance with the Mt Arthur Coal Mine Open Cut Consolidation Project Approval is determined on annual averages.

In 2011, all depositional dust gauges were at or below the annual average criteria of 4 g/m^2/mth with the exception of DD16, which is located north of the operation on Mt Arthur Coal's freehold land and approximately 3.5 kilometres from the nearest sensitive receptor. This gauge is used for management purposes only. The predominant wind direction for the year was from the east south east.

Monthly dust deposition levels in 2011 were all below 4 g/m^2 with the exception of 29 results from the 225 recorded (excluding contaminated results and broken bottles). Compared to the previous year, this was a 3 per cent decrease in the number of monthly results exceeding 4 g/m^2.

Mt Arthur Coal investigated the 29 elevated depositional dust gauge results and an explanation for each result is included in Table 6. Fourteen of the elevated results were recorded on Mt Arthur Coal's freehold land for management purposes only and are not representative of nearby privately-owned residences.

Contamination by bird droppings, insects and vegetation has been an ongoing issue for the Mt Arthur Coal depositional dust monitoring system, with a number of gauges contaminated during 2011. A depositional dust gauge is deemed contaminated by an independent monitoring contractor or a NATA accredited laboratory. Results which are found to be contaminated are excluded from the monitoring results. Details of contaminated depositional dust gauges during 2011 are shown in Table 7.

Depositional dust gauge data capture rates for 2011 fell below 100 per cent at the following sites:

- DD07 – the depositional dust gauge bottle was broken during transit in January 2011. As the sample was unable to be analysed, no result was obtained;
- DD03 – the depositional dust gauge bottle was broken during transit in October 2011. As the sample was unable to be analysed, no result was obtained;
- DD03 – the depositional dust gauge bottle and funnel was found broken at the monitoring site in December 2011. As the sample was unable to be analysed, no result was obtained.

Results recorded during 2011 confirm that existing dust management controls such as water sprays, enclosed conveyors and dumping strategies are proving effective in mitigating depositional dust from Mt Arthur Coal's activities. The depositional dust results are also a reflection on Mt Arthur Coal's commitment to reducing the impacts of mining on the community.

Table 6: Elevated depositional dust results for 2011

Month	Site reference	Result ($g/m^2/mth$)	Explanation of results
January	DD01	5.5	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD02	6.5	This monitor is located to the east of the mine. The predominant wind direction for January was east south east. As this monitor was upwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD03	6.4	This monitor is located to the east of the mine. The predominant wind direction for January was east south east. As this monitor was upwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD16	4.5	This monitor is located on land owned by Mt Arthur Coal used for management purposes only; it is not representative of nearby privately-owned residences.
February	DD01	5.5	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD05	4.2	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD13	4.2	Results at nearby monitors DD11 and DD12 recorded substantially lower results than DD13. This indicates that a localised dust source contributed to this elevated result. DD13 is located north west of the mine. The predominant wind direction for the month was from the east south east. Using DD05 as an upwind monitor, Mt Arthur Coal's contribution was determined to be below 4 $g/m^2/mth$.
	DD18	4.1	This monitor is located to the north of the mine. The predominant wind direction for February was east south east. As this monitor was not downwind of the operation, Mt Arthur Coal's operations did not influence this elevated result.
	DD19	4.4	This monitor is located to the north of the mine. The predominant wind direction for February was east south east. As this monitor was not downwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD20	4.5	This monitor is located to the north of the mine. The predominant wind direction for February was east south east. As this monitor was not downwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
March	DD01	7.2	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD13	5.4	Results at nearby monitors DD11 and DD12 recorded substantially lower results than DD13. This indicates that a localised dust source contributed to this elevated result. DD13 is located north west of the mine. The predominant wind direction for March was from the east south east. Using DD05 as an upwind monitor, Mt Arthur Coal's contribution was determined to be below 4 g/m^2 for the month.
	DD20	4.7	This monitor is located to the north east of the mine. The predominant wind direction for March was east south east. As this monitor was not downwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
April	DD16	5.5	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
May	DD02	4.8	Results at nearby monitors DD01 and DD03 recorded substantially lower results than DD02. This indicates that a localised dust source contributed to this elevated result. DD02 is located east of the mine. The predominant direction for May was north west. Using DD15 as an upwind monitor, Mt Arthur Coal's contribution was determined to be below 4 g/m^2 for the month.
June	DD02	4.2	The wind direction during June was highly variable. This monitor is located to the east of the mine. An analysis of real-time wind data revealed that this monitor was downwind of the mine for 39 per cent of the time during the month. In addition, high rainfall was experienced during June with rainfall greater than 1 millimetre recorded on 11 days. Operations at Mt Arthur Coal were significantly reduced due to rain on eight days in June. These factors suggest that the elevated result at this monitor is likely to be attributable to localised sources and not attributable to operations at Mt Arthur Coal.
	DD03	5.9	The wind direction during June was highly variable. This monitor is located to the east of the mine. An analysis of real-time wind data revealed that this monitor was downwind of the mine for 42 per cent of the time during the month. In addition, high rainfall was experienced during June with rainfall greater than 1 millimetre recorded on 11 days. Operations at Mt Arthur Coal were significantly reduced due to rain on eight days in June. These factors suggest that the elevated result at this monitor is likely to be attributable to localised sources and not attributable to operations at Mt Arthur Coal.
	DD16	5.5	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
August	DD13	5.8	This monitor is located to the west of the mine. The predominant wind direction for August was west north west. As this monitor was upwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD16	4.8	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
September	DD01	4.7	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD16	4.97	This monitor is located on land owned by Mt Arthur Coal used for management purposes only; it is not representative of nearby privately-owned residences.

Continued from previous page

Month	Site reference	Result ($g/m^2/mth$)	Explanation of results
October	DD16	5.4	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
November	DD02	8.2	This monitor is located to the east of the mine. The predominant wind direction for November was east south east. As this monitor was upwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD03	4.1	This monitor is located to the east of the mine. The predominant wind direction for November was east south east. As this monitor was upwind of the operation, Mt Arthur Coal was not the predominant influence on this elevated result.
	DD11	5.3	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
	DD15	4.4	This monitor is located to the west of the mine. The predominant direction for November was east south east. Mt Arthur Coal operations are likely to have contributed to this elevated result, however, results from this monitor remained below consent criteria of 4 $g/m^2/mth$ over the annual averaging period.
	DD16	6.7	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.
December	DD16	6.5	This monitor is located on land owned by Mt Arthur Coal and is used for management purposes only; it is not representative of nearby privately-owned residences.

Table 7: Contaminated depositional dust results for 2011

Month	Site reference	Source of sample contamination
January	DD06	Independent contractor determined that the sample was contaminated with bird droppings.
February	DD02	Independent contractor determined that the sample was contaminated with bird droppings.
	DD03	Independent contractor determined that the sample was contaminated with insects and vegetation.
	DD06	Independent contractor determined that the sample was contaminated with insects and bird droppings.
	DD08	Independent contractor determined that the sample was contaminated with insects and bird droppings.
	DD16	Independent contractor determined that the sample was contaminated with vegetation and insects.
March	DD02	Independent contractor determined that the sample was contaminated with bird droppings.
	DD16	Independent contractor determined that the sample was contaminated with insects.
April	DD05	Independent contractor determined that the sample was contaminated with vegetation.
May	DD05	Independent contractor determined that the sample was contaminated with vegetation and bird droppings.
June	DD05	Independent contractor determined that the sample was contaminated with vegetation and bird droppings.
July	DD05	Independent contractor determined that the sample was contaminated with vegetation and bird droppings.
	DD11	Independent contractor determined that the sample was contaminated with bird droppings.
August	DD05	Independent contractor determined that the sample was contaminated with bird droppings.
	DD11	Independent contractor determined that the sample was contaminated with bird droppings.
	DD12	Independent contractor determined that the sample was contaminated with bird droppings and insects.
	DD17	Independent contractor determined that the sample was contaminated with vegetation and bird droppings.
September	DD11	Independent contractor determined that the sample was contaminated with bird droppings.
	DD13	Independent contractor determined that the sample was contaminated with bird droppings.
October	DD05	Independent contractor determined that the sample was contaminated with bird droppings and insects.
November	DD09	Independent contractor determined that the sample was contaminated with insects and bird droppings.
	DD12	Independent contractor determined that the sample was contaminated with bird droppings.
December	DD02	Independent contractor determined that the sample was contaminated with bird droppings and insects.
	DD13	Independent contractor determined that the sample was contaminated with bird droppings and insects.

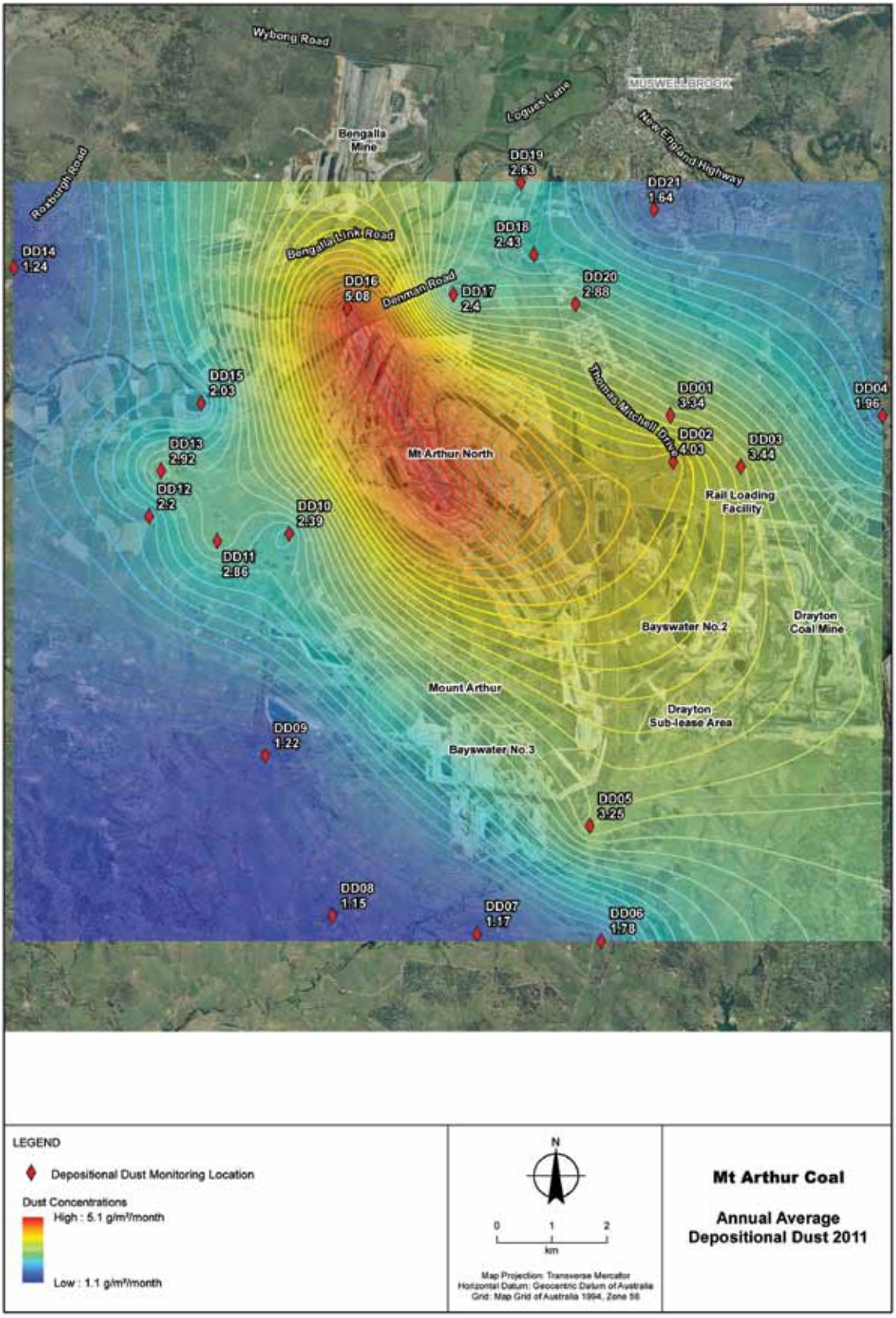


Figure 9: Annual depositional dust concentration

Table 8: Mt Arthur Coal HVAS PM_{10} results summary for 2011

Site name	Site reference	Total events required	Total events captured	Minimum 24-hour result	Maximum 24-hour result	2011 annual average
Roxburgh South	DF01	61	61	1	64	22.2
Windmill	DF02		59	2	68	16.4
Edderton	DF03		61	1	35	14.3
Pistol Club	DF04		59	4	47	21.1
Constable	DF05		61	1	41	17.6
Sheppard Avenue	DF06		61	3	103	21.5
South Muswellbrook	DF07		61	4	50	21.2
Denman Road West	DF08		61	2	56	22.5

High Volume Air Samplers

The maximum allowable limit of particulate matter emissions less than 10 microns in diameter (PM_{10}) from the operation is 30 micrograms per cubic metre ($\mu g/m^3$) for an annual average period and 50 $\mu g/m^3$ for a 24-hour average period. A summary of the 2011 results from Mt Arthur Coal's HVAS is provided in Table 8.

During the year, Mt Arthur Coal remained below the 30 $\mu g/m^3$ annual average criteria, as shown in Figure 10. The 24-hour limit of 50 $\mu g/m^3$ was exceeded eight times on eight different days in 2011, and included air emissions from all sources. An investigation of each of these events was undertaken which involved determining the wind direction for the monitoring period, and then using the difference between monitoring results recorded up and downwind of Mt Arthur Coal's activities to ascertain the operation's contribution. Regional air quality trends at the time and localised influences or events were also considered during the investigations.

The investigations found that the dust levels were a result of regional issues or other localised activities, and that Mt Arthur Coal's contribution was less than 50 $\mu g/m^3$. The calculations and explanation for each of the elevated PM_{10} results during the year are shown in Table 9.

In 2011, HVAS data capture rates fell below 100 per cent at the following monitoring sites:

- Windmill (DF02) recorded no result on 11 October and 17 October 2011. The HVAS monitor did not run on these days as scheduled due to an issue with the program timer;
- Pistol Club (DF04) recorded no result on 22 November and 28 November 2011. The HVAS monitor did not run on these days as scheduled due to a power supply issue.

Results recorded during 2011 confirm that existing controls are proving effective in managing particulate dust emissions from Mt Arthur Coal's activities.

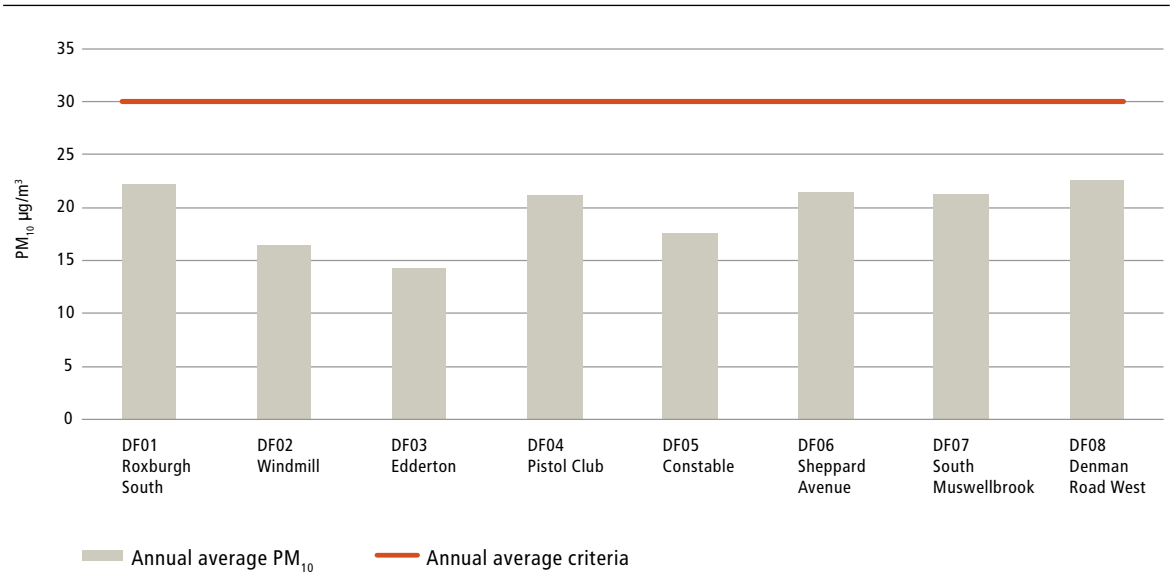


Figure 10: Mt Arthur Coal HVAS PM_{10} annual averages for 2011

Table 9: Elevated HVAS PM_{10} results for 2011

Date of event	Site name	Site reference	Recorded result (µg/m³)	Mt Arthur Coal's contribution (µg/m³)	Explanation of results
20/01/2011	Windmill	DF02	67.0	23.0	This monitor is located to the north west of the operation. The predominant wind direction for this day was from the east south east. Using DF04 as the upwind monitor, Mt Arthur Coal's contribution was calculated by subtracting the DF04 result from the DF02 result for this 24-hour period.
26/01/2011	Windmill	DF02	68.0	12.3	This monitor is located to the north west of the operation. For 82 per cent of this day DF02 was upwind of the Mt Arthur Coal operation. However, winds were highly variable with higher than typical readings recorded at other HVAS units, indicating a regional dust event arising from a number of consistently high temperature days. Subsequently, Mt Arthur Coal was not the predominant influence on this elevated result.
1/02/2011	Denman Road West	DF08	55.0	0.5	This monitor is located to the north west of the operation. For 99 per cent of this day DF08 was not downwind of the Mt Arthur Coal operation. As the predominant wind direction for this day was from the south west this monitor was not impacted by Mt Arthur Coal's operation on this day.
17/09/2011	Roxburgh South	DF01	56.0	0.0	This monitor is located to the west of the operation. The predominant wind direction on this day was from the north west. At no time during the day was this monitor located downwind of Mt Arthur Coal's operation. Subsequently, Mt Arthur Coal was not the predominant influence on this elevated result.
23/09/2011	Sheppard Avenue	DF06	103.0	7.9	This monitor is located to the north of the operation. The predominant wind direction on this day was from the north west. During 92 per cent of the day this monitor was not located downwind of Mt Arthur Coal's operation. Subsequently,Mt Arthur Coal was not the predominant influence on this elevated result.
23/10/2011	Roxburgh South	DF01	64.0	6.6	This monitor is located to the west of the operation. The predominant wind direction on this day was from the north west. During 93 per cent of the day this monitor was not located downwind of Mt Arthur Coal's operation. Subsequently, Mt Arthur Coal was not the predominant influence on this elevated result.
10/11/2011	Roxburgh South	DF01	64.0	5.3	This monitor is located to the west of the operation. The predominant wind direction on this day was from the north west. During 95 per cent of the day this monitor was not located downwind of Mt Arthur Coal's operation. Subsequently, Mt Arthur Coal was not the predominant influence on this elevated result.
16/11/2011	Denman Road West	DF08	56.0	33.2	This monitor is located to the north west of the operation. The wind direction for this day was variable with no one predominant wind direction. For 40 per cent of this day DF08 was upwind of the Mt Arthur Coal operation. Mt Arthur Coal's contribution was therefore determined to be below consent criteria.

View of mining operations from the Mount Arthur summit

Real-Time Air Quality Monitors

Mt Arthur Coal did not exceed the annual average criteria for air quality in 2011 (see Figure 11). The 24-hour average criteria of 50 µg/m^3 for TEOMs was exceeded five times throughout the year, including air emissions from all sources at the one monitoring station. Further investigations into these incidents using wind directional data found Mt Arthur Coal's contribution was less than 50 µg/m^3. The calculations and explanation for each of the elevated PM_{10} results for 2011 can be found in Table 10.

During the year, TEOM data capture rates fell below 100 per cent at the following sites:

- Denman Road West (DC01) did not record data for two days in 2011. The monitor had a faulty temperature and humidity sensor that required replacement;
- Yammanie (DC03) did not record data for nine days in 2011. This was due to a loss of power supply on two separate occasions;
- Constable (DC05) did not record data for 92 days in 2011. Data was not recorded for 79 of these days due to a major equipment fault that required the TEOM monitor to be sent off site for repair. Data was also not recorded for 13 days in 2011 due to power supply issues.

Results recorded during 2011 demonstrate that Mt Arthur Coal is effectively using its real-time dust management system to manage particulate emissions from its mining activities.

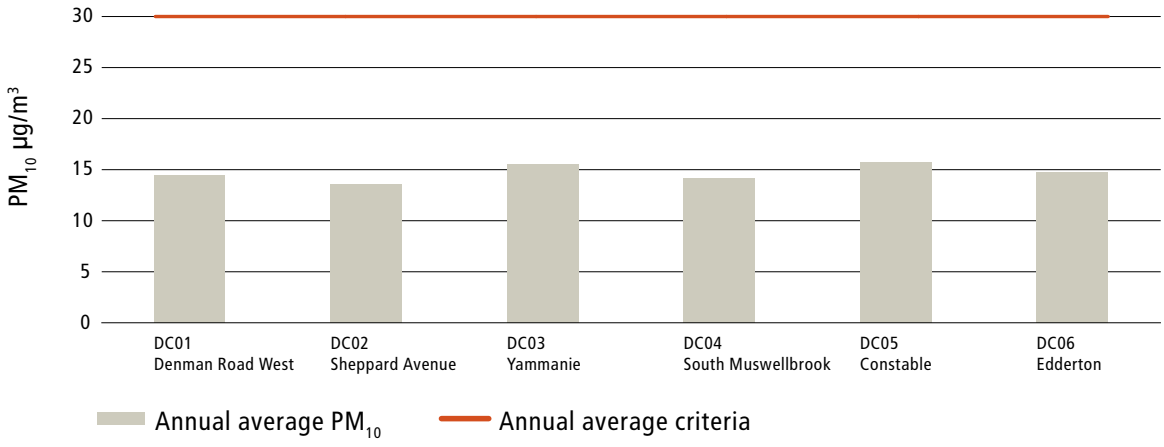


Figure 11: Mt Arthur Coal TEOM PM_{10} annual averages for 2011

Table 10: Elevated TEOM PM_{10} results for 2011

Date of event	Site name	Site reference	Recorded result ($\mu g/m^3$)	Mt Arthur Coal's contribution ($\mu g/m^3$)	Explanation of results
4/02/2011	Sheppard Avenue	DC02	52.8	1.2	This monitor is located to the north of the operation. The predominant wind direction on this day was from the north west. During this day the monitor was not located downwind of Mt Arthur Coal's operation 97 per cent of the time. Calculated based on 15 minute TEOM data and wind direction, Mt Arthur Coal's contribution was assigned when the wind direction was between 170 and 235 degrees.
5/02/2011	Sheppard Avenue	DC02	53.0	1.5	This monitor is located to the north of the operation. The predominant wind direction on this day was from the north west. During this day the monitor was not located downwind of Mt Arthur Coal's operation 98 per cent of the time. Calculated based on 15 minute TEOM data and wind direction, Mt Arthur Coal's contribution was assigned when the wind direction was between 170 and 235 degrees.
9/02/2011	Sheppard Avenue	DC02	100.0	0.0	This monitor is located to the north of the operation. The predominant wind direction on this day was from the west north west. At no time during the day was this monitor located downwind of Mt Arthur Coal's operation. Calculated based on 15 minute TEOM data and wind direction, Mt Arthur Coal's contribution was assigned when the wind direction was between 170 and 235 degrees. In addition, TEOM PM_{10} monitoring results revealed a tenfold increase in dust levels recorded over a one-hour period during the day. This substantial short-term increase suggests that a localised event is likely to have contributed to the high 24-hour result.
5/07/2011	Sheppard Avenue	DC02	50.3	0.0	This monitor is located to the north of the operation. The predominant wind direction on the day was from the west north west. At no time during the day was this monitor located downwind of Mt Arthur Coal's operation. Calculated based on 15 minute TEOM data and wind direction, Mt Arthur Coal's contribution was assigned when the wind direction was between 170 and 235 degrees.
21/10/2011	Sheppard Avenue	DC02	63.0	3.0	This monitor is located to the north of the operation. The predominant wind direction on this day was from the north west. During this day the monitor was not located downwind of Mt Arthur Coal's operation 92 per cent of the time. Calculated based on 15 minute TEOM data and wind direction, Mt Arthur Coal's contribution was assigned when the wind direction was between 170 and 235 degrees.

3.3.3 Management

Mt Arthur Coal has implemented an air quality management plan that provides a framework to monitor, assess and mitigate air quality impacts. Following approval of the Mt Arthur Coal Mine Open Cut Consolidation Project in September 2010, Mt Arthur Coal reviewed the management plan in liaison with government departments and neighbouring mines, including assessing the position of current monitoring locations and existing air quality controls. The updated management plan was submitted to DoPI for approval in March 2011.

Consistent with previous years, there were many controls applied in 2011 to reduce the potential for the generation and movement of dust from site. Operational controls included:

- deploying up to seven water carts across site, including two additional water carts commissioned in 2011;
- utilising dedicated water carts for contractor operations;
- continually rehabilitating mining areas;
- maintaining the short message service (SMS) alarming system for strong winds;
- changing dumping strategies to low areas during strong winds;
- avoiding tipping into strong headwinds where possible;
- restricting blasting to suitable weather conditions;
- maintaining auto-start for stockpile sprays in windy conditions;
- maintaining enclosed coal loading and transfer areas and associated sprays;
- aerial seeding exposed overburden where practicable.

Mt Arthur Coal's aerial seeding program successfully transitioned from a trial to full implementation in 2011. During the year, 165 hectares of exposed overburden not yet ready for final rehabilitation were seeded with a pasture mix developed with assistance from a local agronomist to minimise dust generation. The results continue to be encouraging with good germination across the area without the need for cultivation or irrigation and despite the absence of topsoil.

Environmental Coordinator, Rebecca Smith, inspects a depositional dust gauge at Edinglassie Homestead

Water cart used to suppress dust at Mt Arthur Coal

The application of dust suppressants on haul roads was continued by Mt Arthur Coal in 2011 to minimise dust generation. This involved the use of a non-hazardous liquid polymer (water extender) known as RT9, which is added to the water cart using an automated dosing system from two separate water cart fill points across site. It is then sprayed onto haul roads to improve water penetration, bind fine dust particles and consolidate haul road surfaces.

In 2011, Mt Arthur Coal was nominated as a finalist for a NSW Minerals Council Environment and Community Excellence Award for its holistic approach to dust management. This approach includes aerial seeding, using a larger fleet of smaller water carts and applying dust suppressants at the mine site. Mt Arthur Coal also received a merit award in the BHP Billiton Health, Safety, Environment and Community Awards in recognition of its leading practice dust management approach in sensitive residential area.

To identify improvement opportunities, a review of Mt Arthur Coal's dust management approach was undertaken during the year against *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* prepared by Katestone Environmental Pty Ltd for OEH. Results of the review indicated that Mt Arthur Coal's performance aligned with a number of the key recommended best practice measures within the report. One area of improvement included the potential to utilise a predictive dust dispersion model to assist forecasting areas of risk across the site. This will be explored during 2012 to determine if it can be implemented at Mt Arthur Coal.

Mt Arthur Coal also continued to participate in the Upper Hunter Mining Dialogue Environment workshops, an initiative established by the NSW Minerals Council in response to community feedback. These workshops provide a forum for collaboration between community, government, consultants and mining companies towards improved environmental management focussing on air quality across the region.

Dust controls used at Mt Arthur Coal's CHPP, run-of-mine and product coal stockpile areas and rail loading facility performed well during 2011. These controls were aided by the inherent moisture content of run-of-mine and product coal. The dust control systems for these areas were checked and maintained during the year and operated as required to ensure dust levels remained at acceptable levels.

During 2011, Mt Arthur Coal received 14 general dust complaints, which was an increase on the previous year. In response to each complaint, Mt Arthur Coal reviewed its dust management practices to ensure all appropriate control measures were in place. An investigation of real-time dust monitoring data for each complaint showed that Mt Arthur Coal was operating within statutory requirements.

Based on monitoring results and inspection programs, the dust controls implemented during the year appeared effective in managing dust generation, and Mt Arthur Coal did not receive any government fines or penalties related to dust in 2011.

Mt Arthur Coal will also be submitting proposed dust management controls under a Pollution Reduction Program (PRP) required by OEH in February 2012. This program requires the assessment and, if determined feasible, implementation of best practice dust management measures.

3.4 Weather

2011 Summary

- 824.8 millimetres of rainfall
- 79 rain days
- Temperatures between -0.4 to 41.5 degrees Celsius
- Dominant east south easterly winds

3.4.1 Monitoring Systems

Mt Arthur Coal's real-time meteorological station, located at the mine's industrial area (WS09), is an essential component of the operation's environmental monitoring system. At the station, wind speed, wind direction, temperature, rainfall, solar radiation and humidity data is collected at 10 minute intervals and relayed in real-time using radio telemetry.

The data allows employees at Mt Arthur Coal to assess prevailing weather conditions and modify the mine's operation where necessary to best suit the current conditions. It also plays a vital role in the pre-blast environmental assessment to minimise likely impacts from blasting on the community.

In 2011, the Mt Arthur Coal industrial area meteorological station was calibrated and maintained by an independent monitoring contractor in accordance with relevant Australian standards on a routine maintenance schedule. A summary of the 2011 meteorological data collected at the station is provided in Tables 11 and 12.

Mt Arthur Coal has six other meteorological stations located on land surrounding the site which are used for management purposes only. The locations of the meteorological stations are shown in Figure 8.

3.4.2 Results

Rainfall

Data taken from the industrial area meteorological station (WS09) during 2011 showed that annual rainfall was 824.8 millimetres, an increase on the previous year. The total monthly rainfall and the total number of rain days from January to December 2011 are shown in Table 11.

Due to a problem with the rain gauge no rainfall data was recorded at the station during January, and the data shown in the table was taken from station WS02 for this month. The rain gauge problem was resolved in time for February monitoring.

Temperature

Ambient temperature was monitored at the industrial area meteorological station throughout 2011. The monthly minimum and maximum temperatures recorded at 2 metres for 2011 are shown in Table 12 below. The maximum monthly temperature recorded at 2 metres was 41.5°C in January 2011 and the minimum monthly was -0.4°C in May 2011. Ambient temperatures for 2011 were consistent with previous years.

Table 11: Total average monthly rainfall for 2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rainfall (mm)	44.8*	49.8	46.8	54.4	80.8	126.8	10.8	54.6	89.0	77.4	162.2	27.4	824.8
No. of rain days	4*	8	7	7	6	11	2	6	6	9	7	6	79

** Data sourced from WS02 due to problem with rain gauge at WS09.*

Table 12: Minimum and maximum monthly temperatures for 2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (°C)	12.7	12.5	13.5	8.5	-0.4	1.7	0.9	1.4	2.9	4.1	5.8	8.4
Maximum (°C)	41.5	38.9	34.0	26.9	24.0	19.9	18.8	23.6	28.9	27.7	28.9	28.0

Wind Speed and Wind Direction

Similar to previous years, winds at Mt Arthur Coal during 2011 dominated from the south east quadrant, predominantly from the east south east. Winds from the west north west and north west were also common during the year. A windrose showing the wind speed and direction at the operation during 2011 is shown in Figure 12.

The summer season (January, February and December) was comparable with previous reporting periods with east south easterly winds dominating. Autumn months (March to May) were also dominated by east south easterly winds. Winter months (June to August) and Spring months (September to November) were dominated by west to north westerly winds. Seasonal windroses for 2011 can be found in Figures 13, 14, 15 and 16.

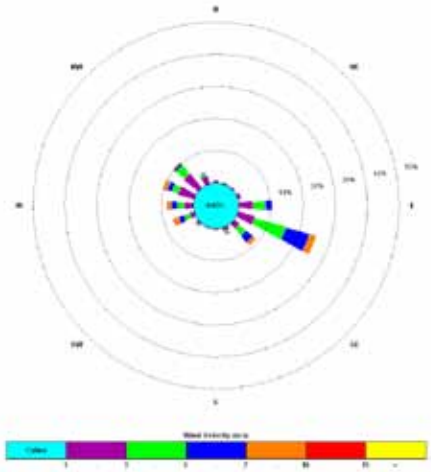


Figure 12: Annual windrose January to December 2011

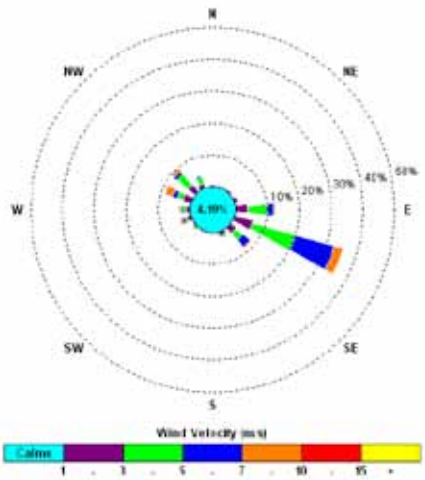


Figure 13: Summer windrose January, February and December 2011

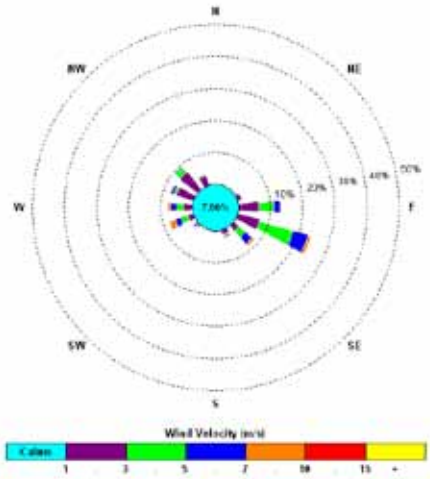


Figure 14: Autumn windrose March to May 2011

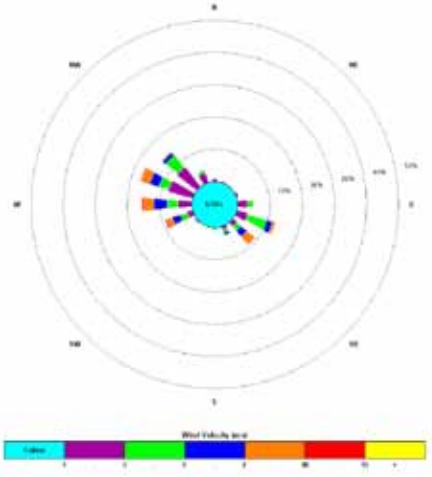


Figure 15: Winter windrose June to August 2011

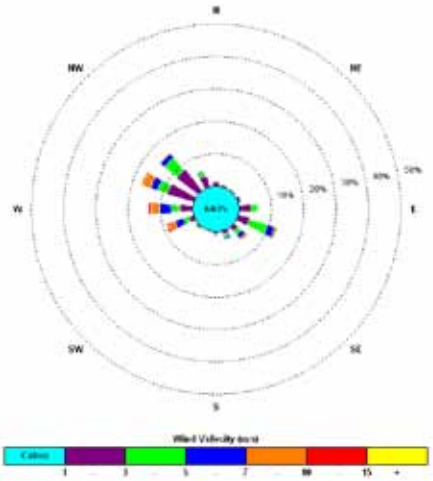


Figure 16: Spring windrose September to November 2011

3.5 Flora and Fauna

2011 Summary

- Completed the annual flora and fauna survey
- Completed the targeted *Diuris tricolor* survey
- Recorded the second highest number of *Diuris tricolor* plants present since monitoring began in 2007
- Complied with all flora and fauna requirements
- Established additional nesting boxes and fauna habitat within the site's offset area
- Undertook further detailed vegetation mapping

Recognising the importance of conserving biodiversity in the local region, Mt Arthur Coal has a range of management strategies in place to limit impacts on native flora and fauna.

Mt Arthur Coal is committed to re-establishing native forest vegetation on at least 30 per cent of the rehabilitation area. Surrounding areas of remnant vegetation are maintained and enhanced with additional plantings of native trees and shrubs to encourage regeneration and fauna colonisation.

3.5.1 Monitoring Systems

Mt Arthur Coal's flora and fauna management plan effectively manages the habitat areas within and near the vicinity of the mine, reducing potential impacts on these areas and improving general habitat quality. The management plan is currently being reviewed and incorporated into the Mt Arthur Coal rehabilitation and biodiversity management plan, which will be submitted to DoPI for approval in the first quarter of 2012.

Each year, Mt Arthur Coal undertakes flora and fauna monitoring to track progress against the management plan objectives. The monitoring program is aimed at tracking the condition of habitat areas over time and ensuring that the management plan's established performance indicators and project approval requirements are being met.

During 2011, Mt Arthur Coal continued to monitor proposed clearance areas and regularly inspected remnant and re-establishing vegetation at the mine site.

3.5.2 Results

Flora and fauna monitoring was undertaken at Mt Arthur Coal in early November 2011 by independent consultants. The annual survey assessed diversity and habitat condition across two remnant and two rehabilitation areas considered to be representative of the ecological communities found on site. The locations of these monitoring sites are shown in Figure 17.

In addition to annual monitoring, a targeted survey of mining lease A171 was also conducted in September 2011 for Pine Donkey Orchid, *Diuris tricolor*, which is listed as an endangered population under the *Threatened Species Conservation (TSC) Act 1995*.

Flora

Remnant sites

Two remnant sites, Saddlers Creek 2 and Mt Arthur North-East Slopes, were surveyed in 2011. The Mt Arthur North-East Slopes monitoring site remained generally consistent in terms of diversity and abundance over time, with 48 species detected in 2011, of which 39 were native and nine exotic. The results showed groundcover, dominated by two native grass species, had increased from 50 to 70 per cent since 2008. At the Saddlers Creek 2 monitoring site, 57 species – 38 native and 19 exotic – were recorded with a high diversity of forbs and native grasses.

Both remnant vegetation sites surveyed in 2011 were recorded as having some weed present, including three noxious species, which did not form a high proportion of the vegetation cover. Natural regeneration was evident at both sites and no threatened plant species were detected.

Rehabilitation sites

Two rehabilitation sites, McDonald's Void Site 1 (MCV1) and Visual Bund site VB3, were surveyed in 2011. Seeded on May 2004, VB3 showed low structural and species diversity with no evidence of regeneration of any native shrub and tree species that had been planted. During the survey 23 species were detected – six native and 17 exotic – of which less than 15 per cent were originally sown in 2004.

Seeded in 2004-05, MCV1 is dominated by a high density of small (4-7 metre), same-age juvenile native trees which will likely form a woodland type vegetation structure in the future. Although the understorey is currently fairly weedy it is expected that more native species will out compete the weeds as natural thinning occurs in the canopy.

Weeds at both MCV1 and VB3 will be monitored and treated as necessary in the coming years.

Diuris tricolor targeted survey

In late September 2011, a targeted survey for the endangered population of Pine Donkey Orchid, or *Diuris tricolor*, was undertaken in mining lease A171. During the survey, 33 *Diuris tricolor* clumps were identified, which was a 25 per cent increase on the number recorded in 2010. Twenty-two new clumps were identified in 2011.

The surveys conducted by Mt Arthur Coal have assisted in better understanding *Diuris tricolor's* flowering patterns. The specimens identified during 2011 were at or beyond their peak flowering period. The flowers recorded during the 2007 and 2009 survey, conducted in early October, were at a late reproductive stage with withered flowers and loss of flowers and leaves. However, the 2008 and 2010 monitoring surveys conducted in late September recorded populations at an early reproductive stage.

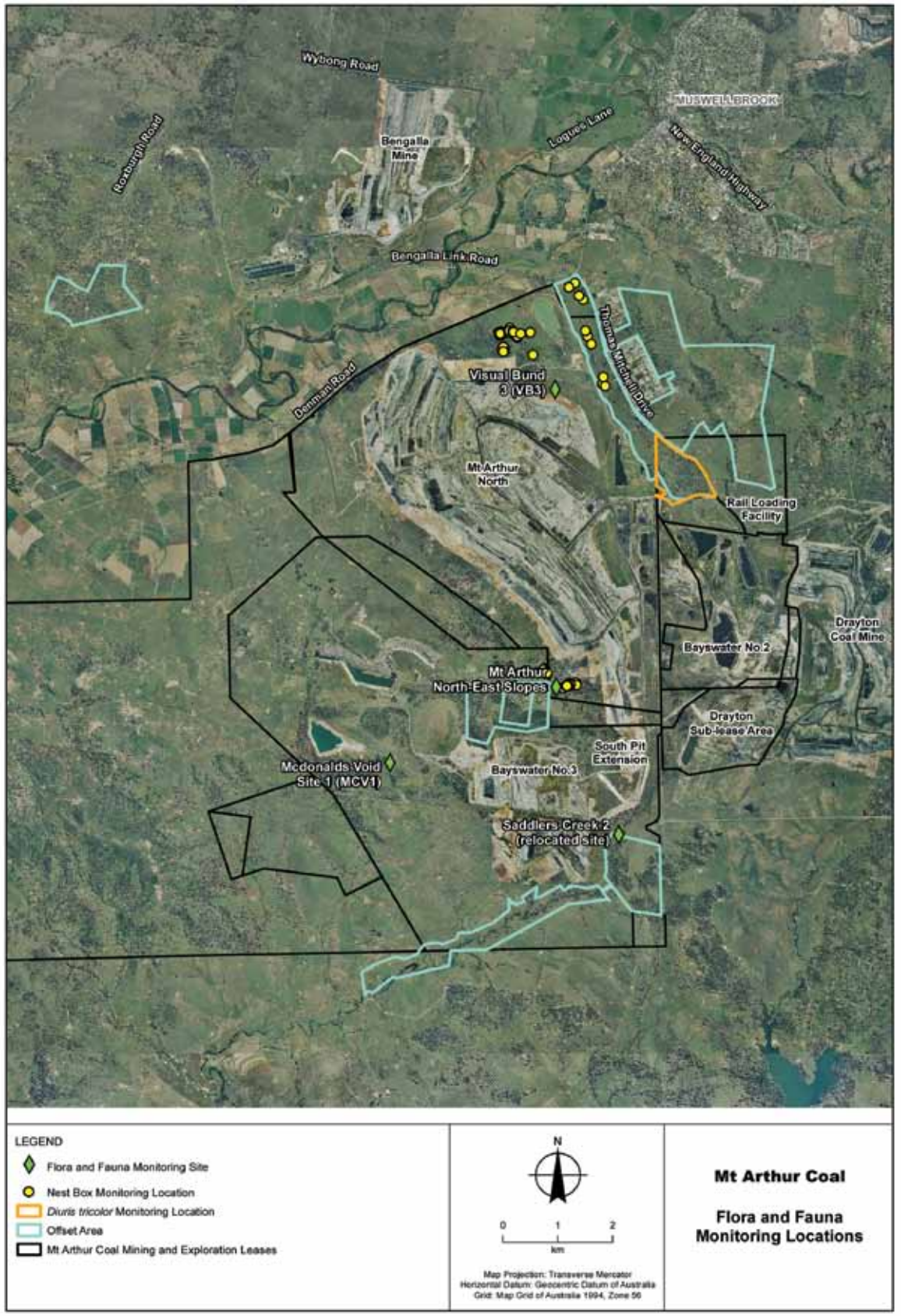


Figure 17: Mt Arthur Coal's flora and fauna monitoring locations

Mt Arthur Coal Environment Superintendent Scott Mitchell inspects an established tree in a rehabilitated area

Overall, the surveys undertaken over the last four monitoring periods indicate that *Diuris tricolor* typically flowers in mid-to late-September, losing its leaves and flowers by mid-October.

Since monitoring began in 2007, 53 clumps have been recorded, with some previously identified clumps found absent each year. This suggests that the population may exist in a state of flux, where individuals of the species do not flower each consecutive year, but may lie dormant in wait of favourable environmental conditions. It is likely that fluctuations in clump size and individuals recorded each year are related to prevailing weather conditions and recent rainfall.

While at present there does not appear to be any significant threats to *Diuris tricolor*, weeds will continue to be managed in mining lease A171 in accordance with Mt Arthur Coal's weed management plan.

Fauna

The diversity of fauna species at Mt Arthur Coal does not appear to have changed significantly from previous years, with 76 fauna species of mostly birds and mammals identified across the four monitoring sites during 2011. Unlike previous years, Mt Arthur Coal did not survey for bats due to unsuitable weather conditions at the time of monitoring, but bats are known to exist on site due to previous survey results.

During the year, 30 fauna species including reptiles, birds and mammals were recorded at the Mt Arthur North-East Slopes, compared to 36 in 2008 and 32 in 2006. The slightly lower number of recorded species is due to the inability to monitor for bats during the survey. At the newly established Saddlers Creek 2 remnant site, 39 fauna species including amphibians, reptiles, birds and mammals were recorded. Both sites provide habitat for a range of fauna due to the presence of grassy woodland, hollows and rocks. Saddlers Creek 2 also provides aquatic habitat with a stream and fringing vegetation.

At the MCV1 rehabilitation site, 29 fauna species were recorded, which were predominantly small woodland birds that prefer shrubby vegetation. Habitat for larger fauna is expected to develop as the trees at the site mature. The Speckled Warbler, listed as vulnerable under the TSC Act, was also detected at MCV1 during the year.

During 2011, 18 fauna species of predominantly birds were recorded at the VB3 rehabilitation site. The young vegetation on VB3 provides only limited habitat suitable for common grassland species, is dominated by weeds and is structurally simple and lacks established habitat features.

In 2011, 62 nest boxes were monitored including 11 new nest boxes established in the Macleans Hill area during the year. As in previous years, when occupied nest boxes were typically habited by Common Brushtail Possums or bees. Unidentified bird chicks were found in one nest box.

The Squirrel Glider, also a vulnerable species under the TSC Act, was not detected in 2011. However, nesting material likely to be from the Squirrel Glider was found in two boxes at the Mt Arthur North-East Slopes site.

There were no other threatened or vulnerable species detected during 2011 at any of Mt Arthur Coal's monitoring sites. The survey data also indicates that Mt Arthur Coal's current management practices are adequately maintaining these areas for native fauna.

3.5.3 Management

Mt Arthur Coal's flora and fauna management plan specifies the planning, monitoring and impact mitigation measures to effectively manage native flora and fauna communities within mining areas and on surrounding land owned by Mt Arthur Coal. Mt Arthur Coal has also established three offset areas in parts of the complex not intended for mining in the current mine plan that provide suitable habitat for various fauna.

Under the consolidation project approval conditions, Mt Arthur Coal has committed to rehabilitate 500 hectares of Whitebox, Yellowbox and Blakely's Red Gum woodland to provide large areas of habitat adjacent to the offset areas and enable connectivity for fauna and flora. Native seed is being collected across site to incorporate into rehabilitation work, and additional detailed vegetation mapping has occurred to target areas for the seed collection process.

In 2011, approximately 11.1 hectares of rehabilitation area was sown with a tree mix of species required to be established in the box gum woodland. Monitoring will be conducted over the coming years to identify any threats to the establishment or diversity of the woodland.

3.6 Greenhouse Gas and Energy

2011 Summary

- Continued to identify energy efficiency opportunities
- Submitted regulatory reports required under Energy Efficiency Opportunities and National Greenhouse and Energy Reporting
- Completed development of a greenhouse gas abatement cost curve

Mt Arthur Coal has been working towards technological solutions to reduce greenhouse gas emissions and increase energy efficiency. This is consistent with BHP Billiton's commitment to achieve a 13 per cent reduction in carbon based energy use per unit of production and a 6 per cent reduction in total greenhouse gas emissions by 2012 against a 2006 baseline. BHP Billiton has shown an improvement trend towards these targets with details outlined in BHP Billiton's 2011 Sustainability Report.

3.6.1 Monitoring Systems

Regular monitoring of fuel, electricity consumption and fugitive gas emissions is an important aspect of greenhouse gas and energy abatement and enables progressive assessment and prioritisation of actions to support operational growth and change.

In 2011, Mt Arthur Coal continued greenhouse gas and energy consumption monitoring with the use of a centralised database to assist with monthly tracking and reporting of key emission sources. A specific focus during the year was to ensure the operation complied with the regulations under the *National Greenhouse and Energy Reporting (NGER) Act 2007*.

The NGER Act provides a single national framework for reporting and disseminating information related to greenhouse gas emissions, greenhouse gas projects, energy consumption and energy production of corporations. Mt Arthur Coal's data capture and reporting strategy assists in ensuring that all Scope 1 and Scope 2 emission sources defined in the regulation are monitored with a consistent approach. Further detail regarding emission sources is shown in Figure 18.

As required under the Federal Government's Energy Efficiency Opportunities (EEO) legislation, Mt Arthur Coal continued to investigate potential projects to mitigate, substitute, reduce or eliminate energy consumption. In 2011, Mt Arthur Coal submitted an EEO report as part of BHP Billiton's publicly disclosed reports.

Some of Mt Arthur Coal's key objectives for improving energy efficiency and reducing greenhouse gas emissions include:

- meeting legislative requirements such as the *Energy Efficiency Opportunity Assessment Act 2006* and the *National Greenhouse and Energy Reporting Act 2007*;
- preparing for a carbon price which will commence in July 2012;
- identifying ways that Mt Arthur Coal can further improve energy management and reduce its energy requirements, including the projects required as part of operational growth;
- developing a greenhouse gas abatement cost curve to assess return on investments;
- encouraging and promoting behavioural change and awareness within the business of energy efficiency opportunities.

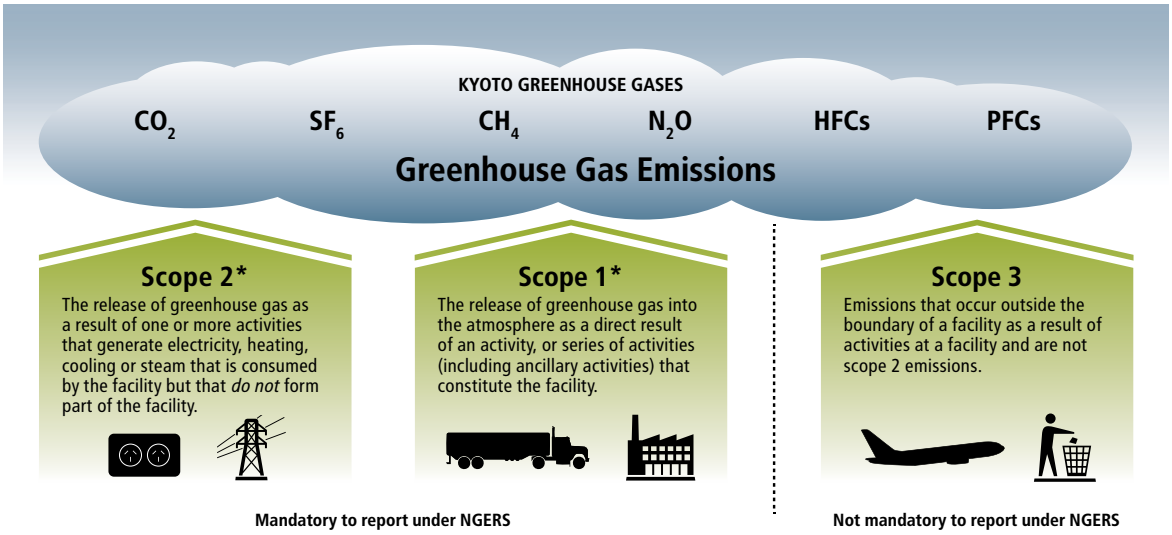


Figure 18: NGER Scope 1, 2 and 3 greenhouse gas emissions
(Source: Department of Climate Change 2008 National Greenhouse and Energy Reporting Guidelines)

3.6.2 Results

During 2011, 93 per cent of energy used at Mt Arthur Coal was attributed to diesel and biodiesel use in mobile and stationary equipment (see Figure 19). Consistent with the previous year, electricity use by the CHPP and electric shovels accounted for the majority of the remaining energy used.

Scope 1 emissions were similar to 2010 and accounted for approximately 95 per cent of all greenhouse gas emissions during the year (see Figure 20). Seventy-six per cent of Scope 1 emissions resulted from fugitive emissions during the coal mining process and 20 per cent from diesel combustion. The remaining 5 per cent of greenhouse gas emissions were from Scope 2 emission sources, in particular from the use of off-site generated electricity.

The data shown in Figure 19 shows an increase in total electricity use during 2011 in comparison to 2010. This increase is likely due to the increased CHPP feed to support operational growth and increased production rates.

Diesel use increased during 2011 in comparison to the previous year. This was primarily due to increased production, procurement of an additional truck fleet and ancillary equipment, increased haul distances and coal being extracted from seams lower in the stratigraphic sequence. Diesel use is forecast to continue to increase in 2012 due to increases in the equipment fleet, haul distances and production.

The use of grease and lubricating oil increased slightly during the year consistent with the procurement of additional equipment. Mt Arthur Coal's oil filtering project assisted in recycling some hydraulic fluids.

As outlined in the BHP Billiton 2011 EEO report, Mt Arthur Coal has implemented nine projects since the EEO program began to reduce energy consumption. A further two are expected to be implemented in the future and one is currently under investigation. The EEO projects implemented include:

- pushing bulk material into the pit bottom;
- reducing idle times for the run-of-mine crusher and conveyor;
- installing an auto shutoff system on the site's lighting plants;
- installing insulation in the operation's administration building;
- effectively using modules within the CHPP;
- providing information technology services in pit to reduce travel to the office;
- operator training on the simulator;
- using solar power for the site's entrance sign and in pit cameras; and
- changing from 793B to 793D haul trucks to provide a more efficient truck fleet.

All of Mt Arthur Coal's energy reduction projects were reviewed and refined during the year to remove any previously suggested opportunities which were either impractical, not feasible, or outside the targeted 'payback' period. Internal reviews and auditing were also undertaken to ensure compliance with the reporting requirements.

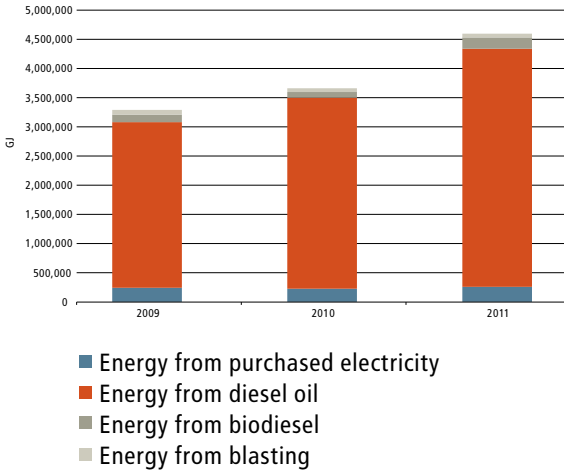


Figure 19: Mt Arthur Coal's annual energy use sources during 2011

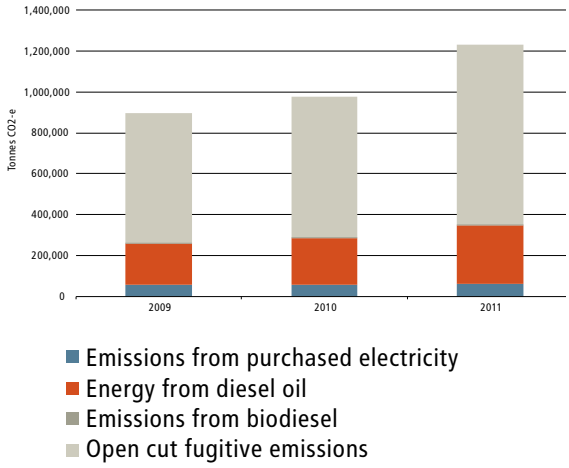


Figure 20: Mt Arthur Coal's annual greenhouse gas emission sources during 2011

3.6.3 Management

Mt Arthur Coal's energy and greenhouse gas management plan was reviewed in 2011, and further amendments are likely to be included to address changing legislative requirements in 2012.

During the year, Mt Arthur Coal continued to forecast energy consumption to effectively manage greenhouse gas emissions in mine planning, equipment procurement and fleet numbers to support growth projects.

Research on coal seam gas levels was undertaken to better understand Mt Arthur Coal's fugitive emissions. Further drilling is expected to commence in 2012 to collect additional data and increase analysis of coal seam gas levels in relation to the advancing pit. This work will contribute towards the improved measurement of fugitive emissions reportable under the NGER legislation.

Due to uncertainty around guarantee of supply, Mt Arthur Coal's use of B20 biodiesel was reduced in 2010, with a 5 per cent blend used during 2011. Options to increase the ratio of biodiesel used at the mine in the future will continue to be investigated.

In 2011, Mt Arthur Coal completed the development of greenhouse gas abatement cost curves to identify the most cost effective abatement options feasible for the operation. The abatement cost curves demonstrate the costs of available projects versus the cost reduction potential of each project. Ten greenhouse gas reduction projects were identified including lighting efficiency upgrades to the office buildings, the use of mobile equipment and lighting plants, increased use of biodiesel and improved drill compressor technology.

3.7 Land Management

2011 Summary

- Commenced installation of perimeter fencing around Mt Arthur Coal
- Replaced perimeter fencing on a number of properties owned by Mt Arthur Coal
- Treated approximately 326 hectares for weeds
- Installed erosion and sediment control measures
- Collected native seed on site for use in rehabilitation and visual screening projects
- Continued wild dog management on land owned by Mt Arthur Coal in collaboration with neighbours

Mt Arthur Coal owns approximately 14,000 hectares of land supporting a diverse range of land uses from mining, exploration and environmental research to conservation, agricultural production and residential use. This land is managed to ensure it is continually improved and adds value to the environment, business and the local community.

3.7.1 Monitoring Systems

Land management and ecological features are monitored continually through regular inspections conducted by Mt Arthur Coal and local land managers. Monitoring is aided by the use of regular aerial photography and feedback from mining personnel and lessees to identify areas of native vegetation, weed infestation, feral animals and ground cover status. A geographic information system database also assists to locate and capture land management data to monitor and program future remediation works.

The environmental dam at Mt Arthur Coal

3.7.2 Results

Mt Arthur Coal's weed treatment program continued in 2011, with approximately 326 hectares of land targeted for treatment, including the mine site boundary, topsoil stockpiles and areas of rehabilitation (see Figure 21). Additional weed management was also undertaken at the Roxburgh Road 'Constable' offset area.

During the year, African Boxthorn, Mother of Millions and St John's Wort were treated using herbicides Ripper 48, Glyphosate, Roundup CT, Roundup 360 and Grazon Extra. Results from the weed treatment program and follow up inspections suggest that treatment has been effective. Additional weed management activities will be undertaken in 2012, including targeting St Johns Wort which has increased in prevalence.

Wild dog and fox management activities continued on land owned by Mt Arthur Coal in 2011, including aerial baiting and establishing 44 baiting stations laced with the poison 1080. There was a decrease in the number of wild dog sightings compared to previous years, with approximately six sightings reported during 2011.

An extensive project to replace perimeter fencing was undertaken on a number of properties owned by Mt Arthur Coal, including around mining lease land and the historic rural property Edinglassie. During the year, Mt Arthur Coal also reviewed gate and access security on a number of sites.

3.7.3 Management

Mt Arthur Coal's land management plan identifies and manages issues that affect land quality, productivity and use, including measures to reduce impacts on existing native flora and fauna and eradicate noxious weeds and vermin. In 2011 the land management plan was divided into a number of plans and procedures, including an erosion and sediment control plan, which has been submitted to DoPI for approval, and a rehabilitation and biodiversity management plan, which is currently being developed.

In 2010, Mt Arthur Coal developed a weed action plan to improve the management of noxious and environmental weeds, which identifies priority areas as well as individual species requiring management. Mt Arthur Coal also worked with a representative from the Upper Hunter Weeds Authority to define target areas and management techniques for particular noxious species. Mt Arthur Coal will continue to treat for weeds and monitor all previously treated areas in 2012.

In late 2011, Mt Arthur Coal commenced a program to collect native seed following a ground survey of vegetation to determine seed viability and likely availability. A seed collection schedule was developed identifying periods of seed availability for target species to help support future seed collection. Approximately 10 kilograms of seed from native shrubs and trees was collected, cleaned and stored in a temperature controlled environment, and selected seeds will be propagated in preparation for planting in April 2012. Mt Arthur Coal will also explore the opportunity to harvest native grass seed in 2012.

Mt Arthur Coal submitted a new erosion and sediment control plan for approval by DoPI in 2011. The plan included measures to ensure sediment dams are established as mining progresses and clean water diversions are managed and inspected.

During the year, sediment control works were undertaken near Ayredale South and throughout construction areas to manage runoff, with additional controls installed near pre-strip areas in Saddlers Pit, North Pit and VD1. Regular field inspections continued to be carried out to gauge the effectiveness of erosion and sediment controls. Inspections were also conducted during and after significant rainfall events to check the integrity of diversion structures and contour banks.

Management programs were maintained for rural residential properties owned by Mt Arthur Coal and leased by tenants. This work included reviewing current lease arrangements to restrict access and land use in some areas to meet ecological and heritage conservation objectives.

3.8 Noise

2011 Summary

- Maintained noise levels below regulated limits
- Installed new sound attenuation equipment
- Integrated a new noise monitoring database
- Submitted a noise management plan to DoPI for approval.

Mt Arthur Coal's continuous improvement program is designed to model, monitor and mitigate the potential for noise impacts on the local community.

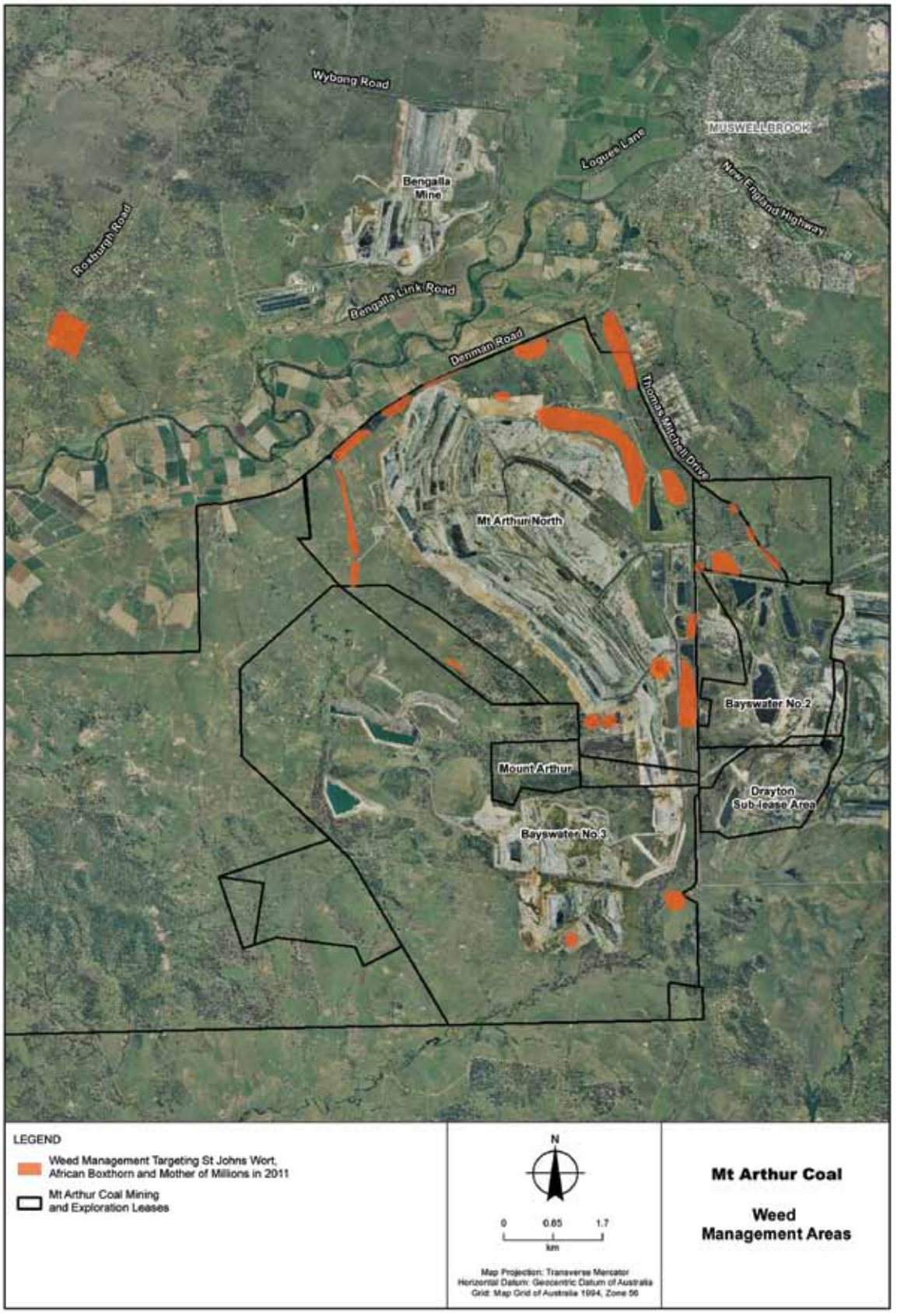


Figure 21: Mt Arthur Coal's weed management locations in 2011

3.8.1 Monitoring Systems

Mt Arthur Coal undertakes continuous and periodic noise monitoring in the surrounding community. Continuous monitoring is undertaken using directional real-time monitors fitted with microphones that record noise levels from three different directions. A standard sound level meter typically uses a single microphone which makes it difficult to distinguish between noise sources. Directional real-time monitors are particularly important when assessing and managing cumulative noise impacts.

Mt Arthur Coal has four permanent directional real-time monitors at various locations surrounding the site as shown in Figure 22. A mobile monitoring unit is also available for targeted noise assessments. In 2011 the mobile unit was used to monitor noise in an area on Roxburgh Road.

Data from the permanent monitors is relayed back to the mine site and continually assessed against statutory noise limits. Audio recordings are also used to confirm the source of the noise when elevated levels occur. When off-site noise levels approach statutory limits, SMS alerts are automatically sent to Mt Arthur Coal's operational personnel which triggers a process to investigate and, if required, implement measures to reduce noise levels to below statutory limits.

Periodic noise monitoring was also conducted on a quarterly basis during the year to provide increased monitoring coverage in areas not captured by the four permanent real-time monitors (see Figure 22). Periodic monitoring involves an acoustic consultant listening and measuring dominant noise source(s) at various locations for a period of time. This data can be correlated with real-time monitoring results and is used to determine Mt Arthur Coal's contribution to the total noise.

An additional temporary monitoring location was added to Mt Arthur Coal's periodic noise monitoring program in late 2011 to better understand noise impacts near Roxburgh Road and respond to complaints from residents in this area.

All of Mt Arthur Coal's noise monitoring equipment is maintained and calibrated in accordance with relevant Australian standards.

3.8.2 Results

Real-Time Noise Monitoring

Real-time noise monitoring limits for Mt Arthur Coal's monitoring sites are measured in LAeq (15 minute), which is the average noise energy over a 15 minute period. In accordance with the NSW Industrial Noise Policy, a high noise period is deemed to have occurred when more than 10 per cent of low pass directional noise LAeq (15 minute) samples in an assessment time period (day/evening/night) exceeds the statutory limit by more than 2 decibels (dB) due to mining activities in suitable meteorological conditions. The statutory limit is exceeded if eight high noise periods or more are identified at a single unattended monitoring location during a rolling four week period.

Where Mt Arthur Coal's monitoring sites recorded a valid LAeq (15 minute) result above statutory limits during the year, an assessment and investigation of audio recordings occurred to determine the source of the noise. A noise result is determined as valid after meteorological conditions are checked to ensure the elevated result is not due to excessive wind or rain, consistent with Mt Arthur Coal's noise management plan and the NSW Industrial Noise Policy.

Mining noises, such as track-slap from dozers, general continuum from engines and final drives of trucks, are typically audible in high noise results. Background noises, including from local traffic, birds, insects and farming related activities, are also audible.

Analysis of Mt Arthur Coal's real-time noise monitoring results in 2011 indicates that mining operations contributed to episodic elevated noise levels at off-site receptors. However, when analysed against statutory limits, the noise levels remained in compliance.

High noise periods were not recorded at any monitor in 2011 with the exception of Denman Road West (NC01) and South Muswellbrook (NC04). Throughout the year the number of high noise periods in any rolling four week period also remained under the limit of eight periods for all monitors during all assessment time periods (day, evening and night). Mt Arthur Coal's real-time noise monitoring results for the year are shown in Appendix 5.

Based on the 2011 noise monitoring results and the annual modelling results from 2010, it was evident that the north western area of Mt Arthur Coal's operations posed the highest risk in terms of off-site noise impacts. As was predicted in the 2010 noise model, Denman Road West experienced the greatest number of mining related elevated noise results. Given the continued advancement of Mt Arthur Coal's operations in 2012, additional emphasis will be placed on monitoring noise impacts at Denman Road West and implementing effective operational controls in this area.

During 2011, consultation continued with Drayton mine to review complaints from residents in the Antiene area related to mining and rail activities and to identify ways to work cooperatively to reduce cumulative noise impacts.

Consistent with previous years, no activity at the CHPP, mine industrial area, rail loading facility or Antiene rail line was detected during continuous or attended noise monitoring.

Figure 22: Mt Arthur Coal's noise monitoring locations

Table 13: Mt Arthur Coal's periodic noise monitoring results for 2011

Location	NP4	NP7	NP8	NP9	NP10	Temporary monitoring location
Noise impact assessment criteria (LAeq(15min))	38	39	37	35	39	35
Land acquisition criteria (LAeq(15min))	43	46	42	40	44	40
23/03/2011	34	33	37	IA	32	
30/03/2011	NM	24	23	30	NM	
12/04/2011	36	IA	42**	IA	NM	
23/06/2011	31	NM	39**	32	37	
07/09/2011	IA	35	35	36*	IA	31
27/09/2011	NM	IA	30	41*	NM	IA
11/10/2011	37	NM	32	33	35	27
18/11/2011	IA	IA	IA	33	33	25

IA – Inaudible. Mt Arthur Coal's operations could not be heard or measured.
NM – Mt Arthur Coal's operations were audible, but were too low to be measured by sound level meters.
** Result does not exceed the EA predicted noise level at NP9 for 2011 (39 dB) by more than 2 dB, therefore this result does not exceed the statutory limit.*
*** Result does not exceed the EA predicted noise level at NP8 for 2011 (41 dB) by more than 2 dB, therefore this result does not exceed the statutory limit.*

Periodic Attended Noise Monitoring

Attended noise monitoring is conducted for 15 minutes on two nights each quarter in accordance with the NSW Industrial Noise Policy and Australian Standard AS1055. A summary of results from Mt Arthur Coal's periodic attended noise monitoring is provided in Table 13.

In accordance with the NSW Industrial Noise Policy, noise samples cannot exceed the statutory limit by more than 2 dB due to Mt Arthur Coal's operations in suitable meteorological conditions, unless the exception has been predicted in the environmental assessment. An analysis of periodic attended noise monitoring results indicates Mt Arthur Coal's operations did not exceed the LAeq(15min) or LA1(1min) statutory limit in 2011.

Consistent with previous years, attended periodic monitoring identified noises from local traffic, insects, frogs, foliage movement, locomotive exhausts and mining activities, such as truck engines and track-slap from dozers, and general continuum from truck engines. Noise impacts from trains were short in duration, and rail movements from the operation were not audible during periodic monitoring in 2011, even though there was rail activity on the Mt Arthur Coal rail loop within the monitoring periods.

Mining Equipment

During 2011, Mt Arthur Coal commissioned a significant amount of new equipment with a continued focus on sound attenuation (see Table 14).

Table 14: Mining equipment commissioned during 2011

Mining equipment	Qty
Hitachi EX5600 excavator	1
Hitachi EX3600 excavator, replacing an equivalent decommissioned excavator	1
Caterpillar 793D overburden trucks	9
Caterpillar 789C coal trucks	3
Caterpillar 777F water trucks	2
Caterpillar 777F fuel trucks	2
Caterpillar D11T dozers	4
Caterpillar D10T dozer, replacing a decommissioned dozer	1
Caterpillar 24M grader	1

Prior to commissioning, all equipment was tested in accordance with international noise testing standards. Mobile equipment is tested at Mt Arthur Coal's dedicated noise testing pad to ensure it complies with the operation's noise specification for stationary and dynamic operation of mobile equipment.

3.8.3 Management

Mt Arthur Coal utilises a comprehensive noise management plan that provides a framework to monitor, assess and mitigate noise impacts on the local community. Management controls include a range of mine planning, operational and engineering measures, and real-time monitoring and alarming systems. These controls were applied during the year and revised as appropriate.

The specific noise mitigation measures employed by Mt Arthur Coal during 2011 included:

- using separate day and night dump areas;
- testing the sound power of mobile equipment;
- considering seasonal influences on noise impacts during mine planning.

In 2010, Mt Arthur Coal conducted a noise reduction project on its P&H4100 shovels. Preliminary investigations were conducted using an acoustic camera to determine and measure the root cause of shovel noise during operation. Modifications were then made to the shovel, including installing self lubricating pads, thrust washers and bearings. Noise levels assessed prior to and following modification showed a significant reduction in the equipment's sound power levels. Based on the success of the project, the modifications were made to all Mt Arthur Coal P&H4100 shovel buckets in 2011.

During the year, Mt Arthur Coal upgraded the mufflers of its R996 excavators to improve reliability and maintain noise levels. Following a number of modifications and trials throughout 2011, Mt Arthur Coal has also identified opportunities to reduce noise from its Caterpillar 793D rear dump trucks, and will commence a program to refit new mufflers to the entire 739D fleet in early 2012.

Improvements to the engine fan area of the Caterpillar 789C rear dump trucks have also been developed to improve the equipment's noise performance. Mt Arthur Coal is scheduled to make these improvement modifications to its 789C fleet in early 2012.

During 2011, Mt Arthur Coal received 26 complaints related to operational and train noise, compared to nine complaints received in 2010. Thirteen of the noise complaints received were from a single resident on Roxburgh Road concerned about a low frequency mining noise. Discussions have been held with neighbouring mines and investigations, including monitoring using the mobile directional monitor, were carried out in an attempt to determine the source of the noise and address the complainant's concern. Immediately following each complaint, the mine's open cut examiners were contacted to review operations to attempt to reduce noise levels at the affected residence.

Mt Arthur Coal did not receive any government fines or penalties related to noise during 2011.

Annual Noise Modelling

Consistent with previous years, acoustic consultants reviewed the accuracy of Mt Arthur Coal's mine noise prediction model. Modelling was focused on winter nights, where atmospheric conditions generally cause higher noise levels. The noise model was developed using GPS trace data of plant movements on the night of 13 July 2011. Noise impacts were then predicted based on planned mining operations, specifically when digger locations are planned to be closest to sensitive receptors in winter 2012.

Modelled predictions showed that the acoustic environmental change from winter 2011 to winter 2012 would reduce by approximately 3 dB at the Denman Road West monitor (NC01). The expected reduction is a result of operations in the northern pits shifting further below the natural surface which will result in more topographical shielding in this area. Acoustic environmental conditions are not expected to change at Mt Arthur Coal's other monitoring locations.

3.9 Rehabilitation and Tailings

2011 Summary

- Rehabilitated 11.1 hectares of land
- Aerial seeded 165 hectares of overburden
- Developed and submitted a rehabilitation strategy for government approval
- Lodged an application for a tailings storage facility extension to DTIRIS for approval

Rehabilitation of disturbed areas is an integral and progressive feature of mining. Mt Arthur Coal manages its rehabilitation activities in accordance with good rural land management practices and statutory requirements, and ensures restored areas are compatible with the surrounding landform and future land uses.

3.9.1 Results

Mining Areas

Mt Arthur Coal completed approximately 11 hectares of rehabilitation at VD1 in 2011. Additional information about the year's rehabilitation can be found in Table 15.

Appendix 6 identifies the areas of rehabilitation completed prior to and during 2011 and the areas proposed for rehabilitation in 2012, which are consistent with the amended mining operations plan submitted to DTIRIS in July 2011.

A program to complete 25 hectares of rehabilitation in Saddlers Pit during 2011 was delayed to allow for investigations and modelling to determine the feasibility of creating a more natural landform based on geomorphic principles. While using geomorphic principles in this area was not feasible due to excessive rehandling of overburden, investigations will continue during 2012 to identify areas where geomorphic landform design could be trialled.

As part of Mt Arthur Coal's commitment to re-establishing White Box woodland communities, areas rehabilitated during 2011 were seeded with a revised tree seed mix. VD1 rehabilitation at the RL260 level (as shown on Figure 23) was sown with a White Box/Yellow Box/Blakely's Red Gum woodland mix. The tree seed mix also included a light pasture and shrub layer to assist initial soil stabilisation and ground cover. Following shaping, gypsum placement and the use of a small amount of organic material, the disturbed areas were completed using topsoil available in close proximity. The topsoil was sprayed and scalped of weeds prior to placement onto the rehabilitation area.

In 2011, topsoil stripping using dozers, excavators and trucks proved effective in recovering the optimal amount of soil, which averaged between 200 and 400 millimetres. Scrapers were also used to recover topsoil in the Saddlers pre-strip area. Consistent with previous years, the average depth of soil varied depending on the topography and local conditions. Prior to topsoil stripping, due diligence surveys were undertaken by Mt Arthur Coal's Environment team with support from qualified ecologists. The team also supervised and inspected potential habitat trees immediately prior to clearing and post felling.

Topsoil management at Mt Arthur Coal focuses on maintaining the value of the topsoil resource as a growth medium, with the following activities undertaken during 2011:

- maintaining a storage height of generally 3 metres or less, consistent with the mining operations plan, to minimise anaerobic conditions within topsoil stockpiles;
- treating topsoil stockpiles to manage weeds;
- mulching trees in disturbance areas, following due diligence surveys, to improve organic and nutrient value within the stockpiles.

Pre-clearance surveys were undertaken in advance of mining activities, exploratory drilling and other areas of clearing. Site inspections were also undertaken following exploratory drilling activities to check rehabilitation progress.

Hollows with potential habitat value were salvaged and reinstated for ground refuge or nest boxes, and all possible efforts were taken to ensure trees remained in place for as long as feasible prior to clearing. Timber was also salvaged near North Pit as part of topsoil stripping activities for fence post construction, with some timber donated to a local not-for-profit community group.

During the year, Mt Arthur Coal collected approximately 10 kilograms of seed from native trees and shrubs located in remnant vegetation areas across the complex. The collected seed will be propagated for planting on the mine site.

Works were undertaken on the contours within rehabilitation areas at CD1 and VD1 during 2011 to ensure that new rehabilitation aligned with existing areas.

Aerial Seeding

In 2011, Mt Arthur Coal continued its aerial seeding program, shifting from a trial program to full implementation. Aerial seeding was applied to 82 hectares of exposed areas in August 2011 and 83 hectares in October 2011. Using a fixed wing aircraft, the selected seed varieties and fertilisers were spread directly to temporarily inactive dump areas, including newly stockpiled topsoil near Saddlers Pit, to establish temporary vegetation to control dust and improve visual amenity.

The seed application rate and species mix was determined by Mt Arthur Coal in consultation with an independent agronomist following overburden sampling. The results of the aerial seeding program continue to show good germination without any need for cultivation or irrigation despite the absence of any topsoil.

Aerial seeded areas continue to be inspected to assess the various stages of growth. A monitoring program will also commence in 2012 to assess germination rates and the stability of pasture establishment, including the percentage of ground cover on the slopes. Regenerative capacity factors, nutrient levels and further soil analysis will also be assessed to determine if changes are required to the application rates and seed mix used for the aerial seeding program.

Maintenance Activities

Mt Arthur Coal completed minor drainage and erosion control works at the mine site during 2011, including

- maintaining contour drains and associated sediment control structures near Saddlers central by installing sedimentation and settling pond controls;
- installing temporary sediment controls around infrastructure areas for expansion project works. A drain and settling basin was also installed near Ayredale south haul road;
- undertaking improvements around Windmill Pit near Denman Road to control surface water off from a light vehicle track. A disturbed area visible from Denman Road was also hydro-mulched to stabilise the site.

Infrastructure Improvements

A number of infrastructure upgrade projects were completed by Mt Arthur Coal during 2011, including expanding the operation's warehouse, administration, workshop and link buildings. Heavy vehicle repair bays, a bathhouse, car park, first aid facility and tool store were also constructed, the fuel facility relocated and the site's sediment ponds expanded.

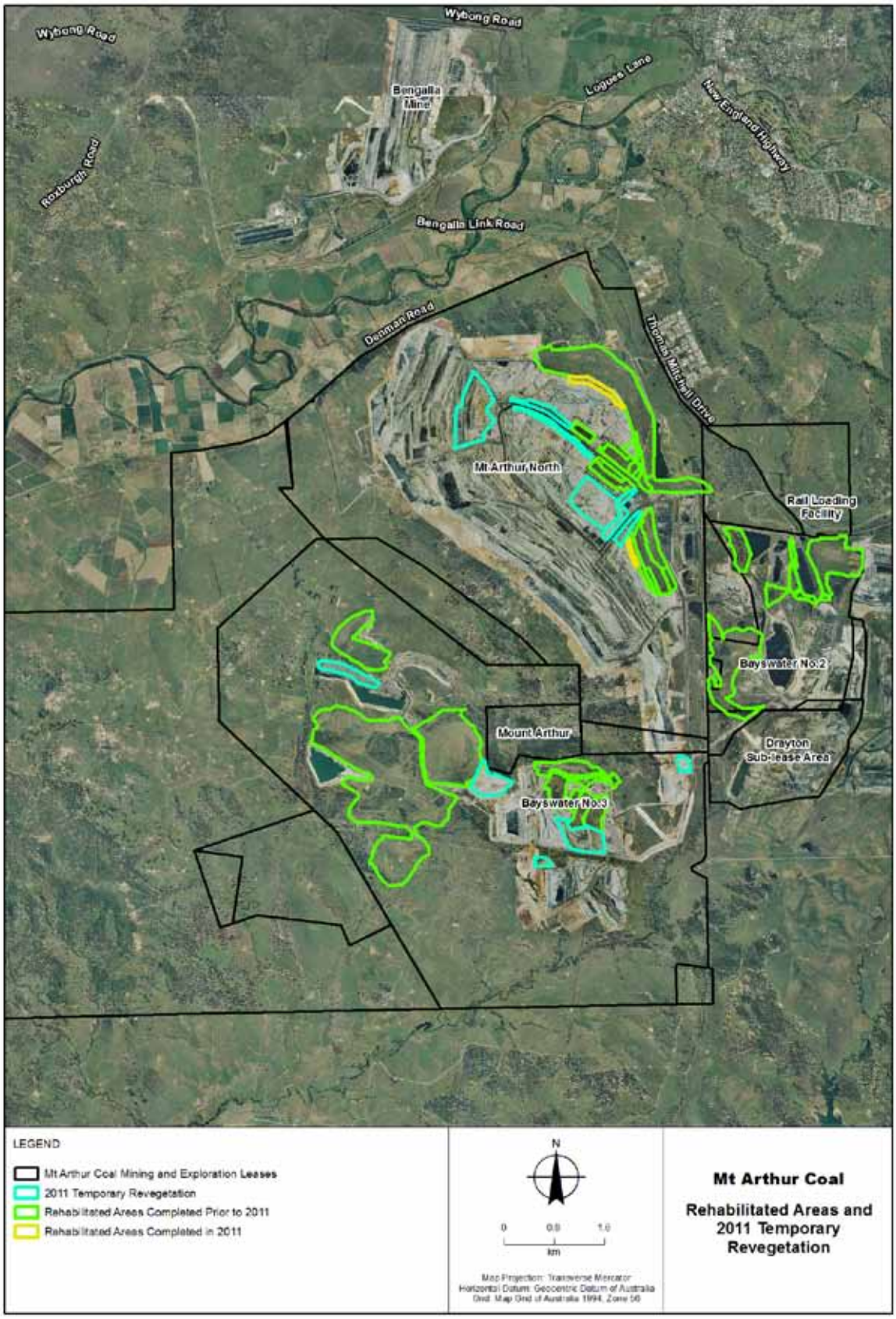


Figure 23. Mt Arthur Coal's final and temporary revegetation 2011

Circular stacker and coal stockpile at the coal handling and preparation plant

During the year contractors utilised and maintained parts of the Bayswater No. 2 industrial area, in particular the workshop, fuel farm, deployment facilities, erection pad and lube bay. Decommissioning and removal of the Bayswater No. 2 CHPP and maintenance area will continue to be investigated as part of a tailings dam expansion project. The security fence erected around the full perimeter of the old Bayswater No. 2 CHPP remained in place during 2011, with the second phase of a hydrocarbon remediation assessment scheduled for 2012.

Tailings Emplacement Areas

The annual external geotechnical audit of Mt Arthur Coal's tailings emplacement areas in 2011 found that there were no immediate short-term actions required. With guidance from independent experts, Mt Arthur Coal will continue to assess and plan for the rehabilitation of its tailings storage facilities, which are all located within CCL 744.

During the year, work continued to decommission the three former tailings cells adjacent to the disused Bayswater CHPP. Tailings from SP3, the largest of the three cells, were reclaimed for processing during the year.

Testing may be undertaken during 2012 to determine the safety and feasibility of capping of the North tailings dam adjacent to the Main Dam. This testing is the first step in understanding the timing and feasibility of capping this dam in the future and ensuring safety of accessing the surface to commence placement of capping material.

Geotechnical investigations including detailed design, field analysis and drilling were undertaken for the proposed tailings emplacement facility. A Section 100 Application under the *Coal Mines Health & Safety Act 2002* for the extension of the existing tailings storage facility was prepared and submitted during December 2011 following the completion of a final detailed design.

During the year, coal processing resulted in solids being consistently around 35 to 40 per cent in the tailings stream by mass. Tailings continued to be pumped to the west cut tailings dam for disposal. Mt Arthur Coal continued to investigate the use of a pipe head flocculation system to assist in the recovery of water and ultrafine coal from tailings emplacement facilities.

3.9.2 Management

The approval of the Mt Arthur Coal Consolidation Project required the development of a rehabilitation strategy and rehabilitation biodiversity management plan. Following consultation with various government departments and the CCC, the Mt Arthur Coal Rehabilitation Strategy was submitted to DoPI for approval in October 2011. The rehabilitation and biodiversity management plan is currently in development and will be submitted to DoPI in early 2012.

Table 15: Mt Arthur Coal annual rehabilitation report for 2011

		2011	2010	Next report (estimated)
A	*Mine lease area*			
A1	Mine lease(s) area	8,464	8,315	8,503
B	*Disturbed areas*			
B1	Infrastructure areas	394	351	373
B2	Active mining areas	1,099	858	1,085
B3	Unshaped waste emplacements	1,355	1,321	1,441
B4	Tailings emplacements	78	78	78
B5	Shaped waste emplacements	9	9	0
All disturbed areas		2,932	2,617	2,977
C	*Rehabilitation progress*			
C1	Total rehabilitated area	920	909	945
D	*Rehabilitation on slopes*			
D1	10 to 18 degrees	19	19	19
D2	Greater than 18 degrees	0	0	0
E	*Surface of rehabilitated land*			
E1	Pasture and grasses	681	681	653
E2	Native forest/ecosystems	238	227	292
E3	Plantations and crops	0	0	0
E4	Other	0	0	0

Maintenance activities

	Area treated (ha)		
Nature of treatment	2011	2010	Comments
Additional erosion control works	4.5	1.5	Focus near Ayredale south and Saddlers Pit, sediment control near project works and new car park construction area.
Re-topsoiling	0	3	Topsoiling of batters and car park earthen banks as part of project works.
Soil treatment	11	0	Gypsum and organic material applied to assist rehabilitation establishment and minimise soil erosion.
Pasture management	0	0	No grazing undertaken on rehabilitation and additional fencing work required.
Reseeding and replanting	16.5	11	Focus on pre-strip area at Saddlers central and Ayredale sediment drain. Cover crop established across the pre-strip surface at Saddlers to minimise disturbed area and dust generation.
Weed control	326	65	Targeting African Boxthorn, St John's Wort and other weeds in vicinity of target species.
Feral animal control	Approx 450	0	44 bait stations set across Mt Arthur Coal land using 1080 poison. Project undertaken in unison with regional aerial baiting program.

Topsoil management

Mining operations	Area treated (m^3)
Stockpiled as at December 2010	4,109,602
Stripped from new areas in 2011	720,300
Used for rehabilitation in 2011	33,300
Stockpiled to date	4,796,602

3.10 Spontaneous Combustion

2011 Summary

- Continued monitoring and reporting of affected areas
- Recorded only minor outbreaks
- Treated 2,646 square metres of spontaneous combustion outbreaks
- Established an action plan to treat spontaneous combustion in the Drayton sublease
- Commenced construction of a haul ramp to access and treat areas of spontaneous combustion

Spontaneous combustion, which occurs when carbonaceous material burns within overburden, interburden and coal stockpiles, can produce a sulphuric odour that is more prominent under specific weather conditions. In the local area, this odour can also result from combustion fires and industrial activities including stack emissions from power stations.

3.10.1 Monitoring Systems

Mt Arthur Coal regularly monitors areas for spontaneous combustion, which is predominantly confined to old mining areas at Bayswater No. 2 and the Drayton sublease area. This is a result of the higher levels of carbon and sulphuric material in the coal seams mined in these Greta measures in comparison to those mined in the different Wittingham measures at the former Bayswater No. 3 and Mt Arthur North mining areas.

Working with the survey team, Mt Arthur Coal inspects all active mining areas each month to monitor elements such as surface cracking, visible smoke, odour and location of new and existing outbreaks. A monthly summary report is produced with a calculation of the total area affected and a map showing the areas of combustion. The monitoring results, including any outbreaks and control works, are reported to OEH and DTIRIS on a six monthly basis in accordance with statutory requirements.

Mt Arthur Coal is continuing to assess airborne thermal scanning as a best practice method for monitoring spontaneous combustion, and successfully trialled this method in mid-2011. The airborne thermal scanning confirmed the areas of spontaneous combustion indicated by the monthly visual inspections. Another thermal imagery scan flight is planned for 2012 to enable comparison against 2011 results.

3.10.2 Results

During 2011 there was minimal change in actual area affected by spontaneous combustion despite a substantial increase in the affected area recorded. In 2011, the area affected was approximately 4,563 square metres, compared to 2,627 square metres in 2010.

This increase is primarily due to the assumption of responsibility for Drayton Sublease CL229, an area which is highly susceptible to spontaneous combustion outbreaks. The Drayton Sublease CL229 contributed 1,438 square metres to total spontaneous outbreaks in December 2011. Additional areas were also identified in 2011 due to increased rigour in the monthly survey of spontaneous combustion outbreaks. However, Mt Arthur Coal is not mining in any areas which are prone to spontaneous combustion. The spontaneous combustion is a legacy issue from previous mining that is being effectively managed.

The results for 2011 are displayed in Figure 24 and referred to in Table 16. As in previous years, the outbreaks recorded were evident as occasional steam or smoke and were largely confined to isolated areas in the West Pit and East Pit at Bayswater No. 2 and Drayton sublease areas. These areas are fully contained within the mining lease boundaries, and the existing road systems and waste area act as a firebreak.

The dump for red rock quarry and Bayswater No. 3 area did not exhibit any outbreaks of spontaneous combustion during 2011, but are inspected regularly in accordance with the management plan.

3.10.3 Management

Mt Arthur Coal has implemented a spontaneous combustion control program to prevent, monitor, control and report outbreaks of spontaneous combustion. The spontaneous combustion control program will be reassessed in light of the tailings dam facility expansion. Following this reassessment, capping and treatment works will be carried out to control spontaneous combustion in high priority areas.

In 2011, Mt Arthur Coal treated 2,646 square metres of spontaneous combustion outbreaks. Treatment included placing inert overburden material over affected areas. The material used consisted mostly of clays which can contain residual moisture and act as a seal to prevent oxygen penetration.

During 2011, an action plan was established to treat spontaneous combustion outbreaks in the Drayton Sublease CL229 (Drayton Void), and mine plans were developed to conduct the treatment required. The construction of a haul road to allow for the emplacement of suitable overburden in line with the action plan commenced in August 2011. Completion of this haul road has been delayed due to the unsuitability of planned capping material, and construction is expected to resume in March 2012 when suitable capping material will be uncovered. The balance of spontaneous combustion outbreaks in Drayton Void will be capped following the construction of the haul road.

Coal stockpiles at the CHPP were closely monitored and small outbreaks were managed in accordance with the management plan.

Mt Arthur Coal received one complaint, in December 2011, relating to spontaneous combustion odour, compared to two complaints in 2010.

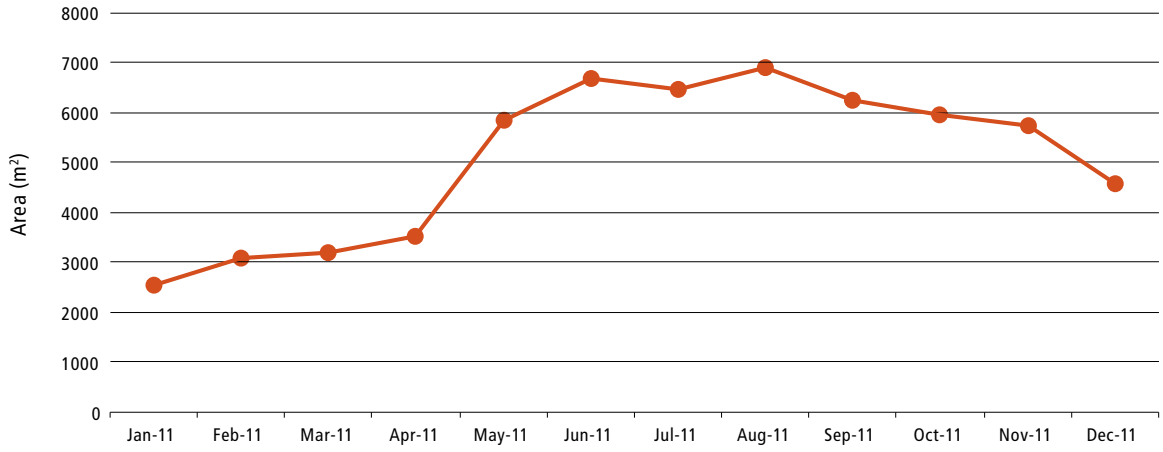


Figure 24: Area of land affected by spontaneous combustion at Mt Arthur Coal in 2011

Table 16: Mt Arthur Coal spontaneous combustion summary 2011

Month	Outbreak area at start of month (m^2)	Area of new or recurring outbreaks (m^2)	Area of naturally extinguished or repaired (m^2)	Balance area of outbreaks (m^2)	Comments
Jan	2,627	406	490	2,543	New outbreaks detected near grading. 115m^2 of outbreaks also treated by grading work.
Feb	2,543	646	122	3,067	121m^2 of outbreaks capped.
Mar	3,067	1,311	1,170	3,208	1,057m^2 of outbreaks capped. Sublease CL229 added to area of responsibility contributing 1269m^2.
Apr	3,208	305	0	3,513	Weather conditions facilitated the detection of new outbreaks.
May	3,513	2345	0	5,858	Weather conditions facilitated the detection of new outbreaks.
Jun	5,858	838	0	6,696	Weather conditions facilitated the detection of new outbreaks.
Jul	6,696	329	582	6,443	Weather conditions were less conducive to the detection of outbreaks than previous months. 136m^2 of outbreaks capped.
Aug	6,443	463	24	6,882	24m^2 of outbreaks capped. A few new outbreaks from equipment activity.
Sep	6,882	19	640	6,261	51m^2 of outbreaks capped.
Oct	6,261	123	415	5,969	Warm weather conditions limited the detection of outbreaks. No control works undertaken.
Nov	5,969	95	323	5,741	Warm weather conditions limited the detection of outbreaks. 50m^2 of outbreaks capped. 95m^2 of new areas detected in CCL744.
Dec	5,741	70	1,248	4,563	1,092m^2 of outbreaks capped. Close inspection of CL229 sublease revealed 70m^2 of newly recorded outbreaks.

3.11 Visual Amenity and Lighting

2011 Summary

- Implemented management plans for on-site lighting
- Purchased new light-emitting diode (LED) lighting plants
- Submitted a visual impact report to DoPI for approval

3.11.1 Monitoring Systems

Mt Arthur Coal's mine plan is regularly reviewed by pit supervisors and mining engineers, and the visibility of the site is monitored to minimise visual impact on surrounding areas and the amount of light potentially visible off site. Risk assessments for new or modified mining activities also include a review or modelling of visual amenity where applicable.

Landscaped areas, including earth bunds and tree plantings off Edderton Road, Denman Road and Thomas Mitchell Drive, continue to successfully screen the Mt Arthur Coal complex, although site areas can be seen from parts of Denman Road, Roxburgh Road and elevated areas around Muswellbrook. These landscaped areas and other visual screens are inspected annually by members of the Environment and Community team and corrective actions taken where necessary. As a result of good rainfall throughout 2011, vegetation cover has increased on rehabilitated areas, including the groundcover on the visual bund.

Monitoring during the year confirmed that Mt Arthur Coal's planning and operational controls were generally effective in reducing lighting impacts at night to the north of the mine. Mt Arthur Coal will continue to review the options for mitigating the visual impact of the mine operations in the future.

3.11.2 Management

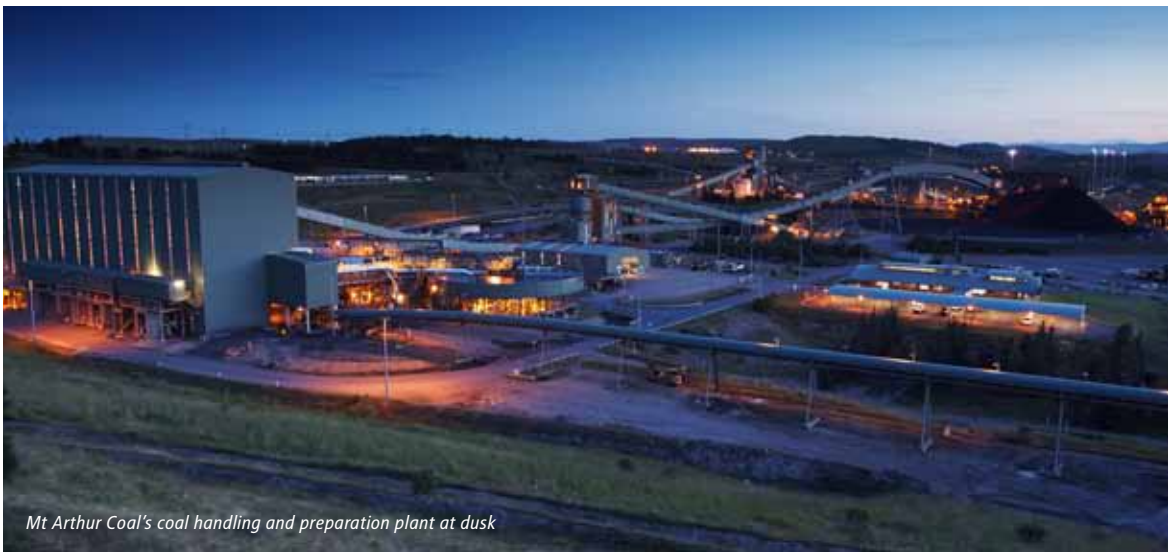
Mt Arthur Coal has implemented management plans for lighting and landscaping that specify the control measures to reduce the visibility of the operation off site. These measures include designing overburden dumps to create visual bunds and barriers to the operation, planning for the provision of day and night dumps to keep lighting impacts to a minimum, and regularly inspecting lighting plants and the operation to ensure effective management.

Windrows were shaped and hydromulched along Denman Road in 2011 to improve visual amenity. The windrow is necessary due to the advance of mining, as well as the installation of a powerline and sub-station in this area.

During the year there were eight complaints received relating to lighting, in comparison to four in 2010. All but one of the complaints received in 2011 were from residents or drivers located north west of Mt Arthur Coal, and in all cases the lighting plants causing the impact were immediately relocated or redirected.

In 2011, Mt Arthur Coal purchased new mobile LED lighting plants to reduce its impact on the environment and the community. The new lighting system uses high-powered, long-lasting LED lights that reduce amount of glare and light spillage, effectively reducing the amount of potential light visible off site. The plants are the first of their kind worldwide and reduce fuel consumption by 50 per cent. An additional benefit is that the lights are extra low voltage, eliminating the risk of electrocution for the mine's employees who service the equipment. Up to eight plants will be installed during 2012.

Lighting from Mt Arthur Coal will continue to be implemented in accordance with the EMS and managed to minimise impacts on the local community whilst maintaining the minimum level necessary for operational and safety needs.



Mt Arthur Coal's coal handling and preparation plant at dusk

Operations in the northern areas of the mine and some overburden emplacement areas are currently highly visible. Visibility of the operations will remain until mining equipment is based on lower benches of the pit, and the final landform design heights are reached and rehabilitation can occur.

As required under the Mt Arthur Coal Mine Open Cut Consolidation Project Approval, a visual impact assessment to identify privately-owned land likely to experience significant visual impacts from Mt Arthur Coal has been lodged with DoPI for approval. A number of landholder specific impact assessments were undertaken in 2011 supported by monthly visual assessments and site inspections by planning and technical services personnel.

3.12 Waste Management

2011 Summary

- Recycled 91 per cent of total waste from site
- Managed all waste on site through a total waste management system

Mt Arthur Coal's Total Waste Management System has been designed to meet both legislative and BHP Billiton requirements that seek to minimise the generation of waste and maximise reuse and recycling. This system consolidates the disposal, tracking and reporting of all waste generated on site.

3.12.1 Monitoring Systems

To ensure the waste management system is working effectively and remains appropriate for the changing needs of the operation, regular inspections and monitoring is conducted. In 2011, Mt Arthur Coal's waste contractor conducted weekly site inspections of all areas where wastes were being generated and stored.

Hydrocarbons and chemical spills and the use of containment products, such as spill absorbent products, were also monitored as part of these workplace inspection programs. During the inspections, there was regular consultation with mine site employees and contractors to identify issues and opportunities for improvement.

3.12.2 Results

In 2011, Mt Arthur Coal's mining and related activities generated 8,298 tonnes of waste, which was a 22 per cent increase on the previous year's results. The increase, which was predominantly effluent and recyclable waste, resulted from an increase in the number of contractors and employees on site and the construction activities undertaken as part of the operation's expansion activities. The recyclable component of the waste produced in 2011 was 91 per cent, as shown in Figure 25, which was consistent with the previous year.

In 2011, the largest contributors to total waste were effluent (56 per cent), waste oil (16 per cent), general waste (8 per cent) and scrap steel (7 per cent). Each of these categories of waste, except general waste, was recycled. Also contributing to the increase in recyclable waste in 2011 was a substantial decrease in the amount of tyres buried. This was primarily due to the reuse of tyres on site for traffic delineation in the mining and industrial areas and continued work on improving tyre life performance.

Monitoring of other waste performance measures indicated that Mt Arthur Coal achieved high levels of compliance including in the areas of waste segregation and tracking. General awareness through toolbox talks and other site communications contributed to a continued high level of correct waste segregation in 2011.

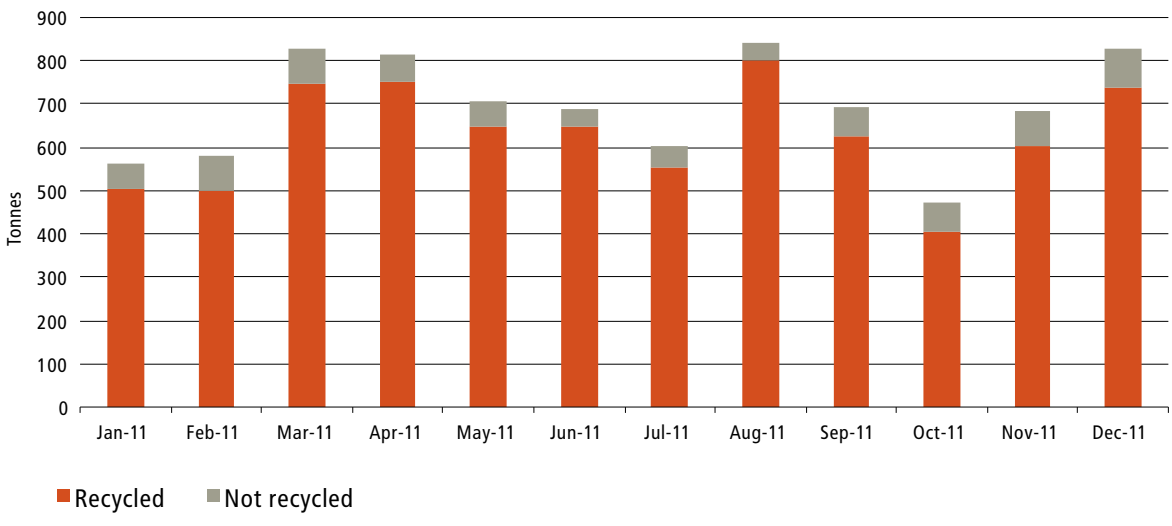


Figure 25: Waste disposal at Mt Arthur Coal in 2011

3.12.3 Management

Mt Arthur Coal's waste management plan details the correct procedures for minimising, storing, transporting, disposing, tracking and reporting wastes generated on site. A spill response procedure is also in place that prescribes the steps to be followed in the event of a spill.

Weekly waste management inspections allow for early detection of waste management issues such as waste segregation, enabling any issues to be rectified immediately. All inspections are recorded in a register and actions are assigned to employees to rectify issues within their areas. This has assisted in increasing awareness and the constant education of the employees and contractors at Mt Arthur Coal in relation to waste issues.

During 2011, Mt Arthur Coal maintained waste tracking documentation, in accordance with legal and other requirements, and did not receive any government fines or penalties related to waste management.

3.13 Water Management

2011 Summary

- Utilised rainfall runoff for approximately 75 per cent of water used on site
- Decreased total water consumption from the Hunter River by 35 per cent from the previous year

Mt Arthur Coal's water management system is founded on principles that emphasise water reuse and minimise impacts on the surrounding areas. The system recognises the importance of effective water management to minimise the potential for impacts on natural water flows and ecological systems while allowing for coal processing and dust suppression.

3.13.1 Monitoring Systems

Mt Arthur Coal's water management system includes monitoring surface and ground water sites according to an approved schedule. Surface water monitoring sites include creeks, mostly ephemeral, and dams that surround the mining area, while groundwaters are representative of the numerous aquifers found below the natural surface.

During 2011, water monitoring results were reported on a regular basis to mine management, government agencies and the CCC. The Mt Arthur Coal water monitoring network consisted of 21 surface water and 46 groundwater monitoring sites. The location of surface and groundwater monitoring sites are displayed in Figure 26.

Surface water sites are monitored monthly while groundwater sites are monitored every two months. All surface water sampling locations remained consistent with the previous year, with the exception of SW25 and SW26 which were removed during 2011 following a review of the water management plan and changes to the underground adit.

The environmental dam and visual bund at Mt Arthur Coal

All groundwater monitoring locations remained consistent with the previous year, with the exception of GW13 and GW15 which were removed in 2011 due to progression of the mining operations. Additional non-routine water samples were taken during 2011, including from the oil and water separator, wash plant, wash bay and clean water areas to ensure acceptable water quality following rainfall events.

Surface and groundwater samples are analysed for pH, electrical conductivity (EC), total suspended solids (TSS), total dissolved solids (TDS) and filtered iron. Surface and ground water monitoring data is provided in Appendix 7. Additional testing of sulphates, nitrates and oil and grease is conducted for surface waters. Selected surface water sites are also analysed for heavy metals, cations and anions. Chemical speciation is undertaken for all groundwater sites every two years. All sampling is conducted in accordance with Australian standards and analysis is undertaken by a NATA accredited laboratory.

In addition to water quality monitoring, Mt Arthur Coal also regularly monitors the water balance for the operation to assist forecasting and modelling for different climatic and site scenarios. A series of flow meters and surveyed volumes are utilised to monitor the use and transfer of water between key water storages. All flow meters were calibrated during 2011 and water storages were surveyed on a weekly and monthly basis to ensure the accuracy of water volume data. Further detail regarding the water balance can be found in section 3.13.3.

Mt Arthur Coal's site water management plan was reviewed, updated and submitted to the DoPI for approval in 2011. The plan includes:

- a site water balance;
- an erosion and sediment control plan;
- a surface water monitoring program;
- a groundwater monitoring program;
- a surface and ground water response plan.

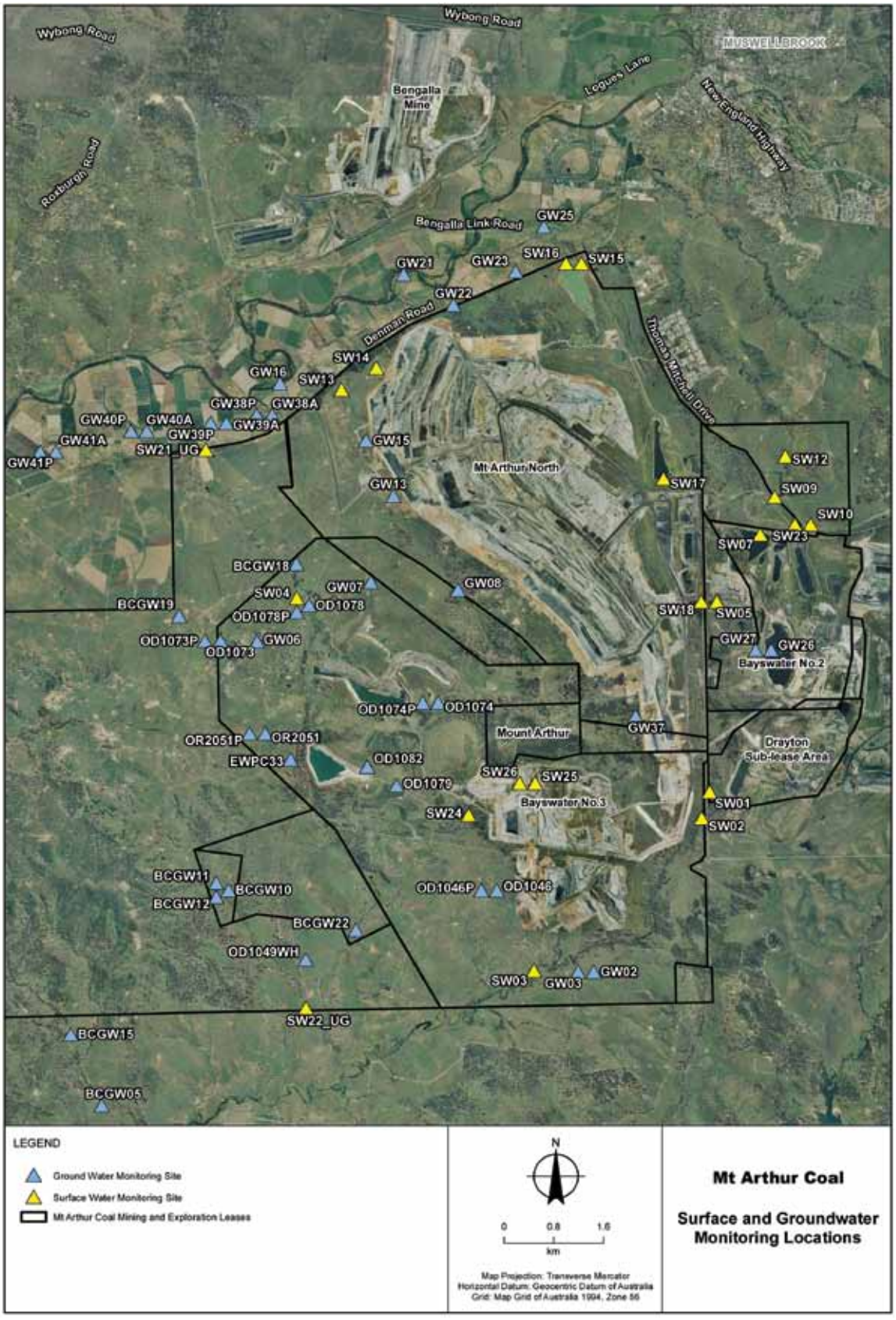


Figure 26: Mt Arthur Coal's surface and groundwater monitoring locations

3.13.2 Results

Surface Water

Surface water EC ranged between 213 microsiemens per centimetre (µS/cm) and 11,800 µS/cm, which is generally consistent with the results from 2009 and 2010. The pH measured at individual sites remained relatively constant, ranging between 6.6 and 9.2. Total suspended solid results remained relatively low and were also consistent with previous years, with the exception of SW02 in October 2011. Further investigation revealed the elevated TSS result was recorded following a rainfall event, reflecting the initial spike in TSS levels commonly seen after a change from dry to wet conditions. During the investigation process the TSS level for SW02 was compared against SW03 which is located downstream of SW02. Results showed that the TSS level at SW03 in October 2011 was lower than SW02. Results also showed that the TSS level at SW03 was low and consistent with previous TSS monitoring data for the site. Consequently, the elevated TSS levels were shown to be localised to surface monitoring site SW02 and did not impact on monitoring locations located further downstream.

Analyses of the water in the main dam (SW07) and environmental dam (SW16) reflect the mixed waters that were received into these storages. In 2011, the water in both dams continued to be saline, comprising of non-mine and mine water sources.

Water qualities in natural watercourses surrounding the mine including Saddlers Creek (SW01, SW02 and SW03), Quarry Creek (SW04), Ramrod Creek (SW12), Fairford Creek (SW13) and Whites Creek (SW14) were subject to normal variations in response to the ephemeral nature of the creeks, local geology and weather conditions. Additional non-routine surface water sampling was undertaken along these creeks, typically following heavy rainfall events, to ensure localised runoff and stream quality were acceptable.

All results were generally consistent with trigger levels in the Australian and New Zealand Environment Conservation Council (ANZECC) Guidelines for fresh and marine water quality. ANZECC levels are not mandatory criteria but are used to assess and manage water quality from a range of water resources. The monitoring data collected during 2011 continues to indicate that there are no adverse impacts from mining on surface water quality around the mine site.

Groundwater

Monitoring of water levels and water quality parameters is undertaken at the piezometers which generally consist of a small diameter observation well lined with plastic pipe. The EC measured in piezometers ranged between 580 µS/cm and 13,810 µS/cm which is generally consistent with the previous year's results. The maximum recorded EC level was at site BCGW22, which had consistently high EC levels (above 9,000 µS/cm) during the course of the year and in previous years.

The pH measured within groundwater piezometers ranged between 5.3 and 12.3, which was consistent with the previous year's results. The minimum recorded pH value was at site OR2051-Piezo located to the west of the Bayswater No.3 area. This site was only sampled on two occasions during 2011 and was blocked for the remainder of the year. The higher pH values were sampled from OD1079-Piezo located within rehabilitation near Belmont South and OD1049-WH, located off site on the western side of Edderton Road. Both sites have historically recorded high pH levels. Monitoring site locations are shown in Figure 26.

Groundwater depths generally remained stable throughout 2011. Piezometers GW8 and GW23 showed a slight decrease in groundwater depth, suggesting additional water inflow to the pit during June and October 2011. GW27, an onsite piezometer located at the west cut tailings dam, showed a slight increase in groundwater depth in February 2011.

A schematic of the change in potentiometric (aquifer pressure) surface for 2011 is provided in Appendix 8. The schematic shows results consistent with changes in water level as a result of active mining and in line with current approvals and modelled predictions.

Similar to the previous year, negative drawdown (rise in water level) is concentrated around the advancing Windmill, Huon and North pit faces. Negative drawdown is also apparent to the south and west of the Saddlers pit face with GW2 recording a -1.4 metre drawdown over the 2010-2011 water year. Overall, groundwater drawdown in 2011 ranged from -1.40 m to 0.22 m. This is a much narrower range compared to previous years where groundwater drawdown ranged from -4.35 m to 6.93 m.

In 2011, Mt Arthur Coal did not reach the trigger levels specified in the groundwater monitoring program and therefore no investigations were required.

In 2011, three new monitoring bores were established on land owned by Mt Arthur Coal to undertake additional investigations of the alluvium. The bores will provide additional data to assess geological faults in the northern end of the pit and supplement data collected from previous monitoring.

A list of results taken from Mt Arthur Coal's surface water and groundwater monitoring locations in 2011, including basic statistical analyses and graphs for individual sites, are provided in Appendix 7. Overall, the results are consistent with those from the previous year and indicate that no adverse groundwater quality trends are being caused by mining activities.

3.13.3 Management

Mt Arthur Coal's system for effectively sourcing, diverting, storing, using, monitoring and reticulating water on site is outlined in its water management plan. In 2011 the management plan was revised and submitted to DoPI for approval, along with additional plans including a groundwater and surface water response plan.

The key objectives of Mt Arthur Coal's water management plan are to:

- where possible, divert runoff from undisturbed areas and allow to drain from the site;
- contain runoff from areas disturbed by mining activities;
- provide water storages to ensure sufficient capacity for mine site usage and for dry and wet periods;
- recycle on-site water;
- preferentially use site water collected either in-pit or in water storages prior to higher quality water from the Hunter River;
- direct runoff from rehabilitation to sediment traps and settling dams to remove suspended sediment, prior to drainage from site or use within the mine water management system;
- provide suitable flood protection and dewatering capability for mining operations and the open cut pit.

Water was predominantly sourced from rainfall collected in the pit, percolation through spoil and groundwater seepage, recycling via hardstand runoff, water from the MSC effluent reuse scheme and water imported from the Hunter River.

A water management system is used to manage water to assist in minimising Mt Arthur Coal's reliance on clean water use by maximising the use of recycled water and runoff, existing water stored on site and water collected in the pit. An overview of the site water management system is illustrated in Figure 27. Sediment control and improvements to drainage around operational areas, in particular topsoil stripping areas, was implemented during 2011.

An integrated reticulation network has been developed to manage water transfers between water sources. Extensive flow metering and monitoring complements the system to enable efficient management of water resources across the site. This network will continue to be upgraded with procurement of additional pumps, pipelines and flow meters in line with operational growth.

Additional water access licences (WALs) were purchased with some properties throughout the year (see Table 18). Where plans indicated that there would be sufficient water stored onsite, water allocations from the Hunter River were offered to lease holders and near-neighbours as a temporary transfer to ensure adequate land and water management of non-mining lands around the operation.

Approximately 49 per cent of all water used at Mt Arthur Coal during the year was in the CHPP for coal processing, dust suppression on domestic and export stockpiles and coal wash down. This result was consistent with the previous year.

During 2011, Mt Arthur Coal implemented a number of initiatives relating to site water management including:

- continuing investigation into water saving opportunities;
- revising the water model in line with operational growth;
- reviewing and updating the site water management plan;
- reviewing available water storage options and supply rates for use at site;
- lowering dam operating levels to allow for more storage capacity following rainfall events;
- installing additional flow meters on key fill points;
- installing and maintaining new and existing sediment controls.

Mt Arthur Coal did not receive any government fines or penalties related to water during 2011.

Water Balance

Mt Arthur Coal uses a quantitative water model to predict the mine water balance in advance of the mining operation and provide a snapshot of available water at a given point in time based on a number of variables. Model predictions are then used to assist in operational planning and future water quantity requirements.

In 2011, the probabilistic site water model was used to develop future scenarios with a wide number of variables to determine water demand and site requirements. The water model was upgraded in early 2011 to factor in proposed future changes to the site water management system and update input data into the model.

An overview of key inputs and outputs of the 2011 water balance, which is tracked on a monthly basis, is illustrated in Table 17 and shows that the operation was a net generator of water during the reporting year. Total water usage increased during 2011 in comparison to the previous year in line with increased production.

In reviewing the mine water balance for 2011, approximately 75 per cent of all water sourced by the site was from rainfall runoff being captured in both in-pit and out-of-pit storage areas. During the year, 824.8 millimetres of rainfall was recorded producing an estimated 8,148 megalitres (ML) of runoff.

Approximately 13 per cent of water was sourced from the Hunter River, drawn in the form of WALs (see Table 18). Water sourced from the Hunter River decreased by 785.9 ML in comparison to the previous year, predominantly due to increased rainfall and localised catchment runoff.

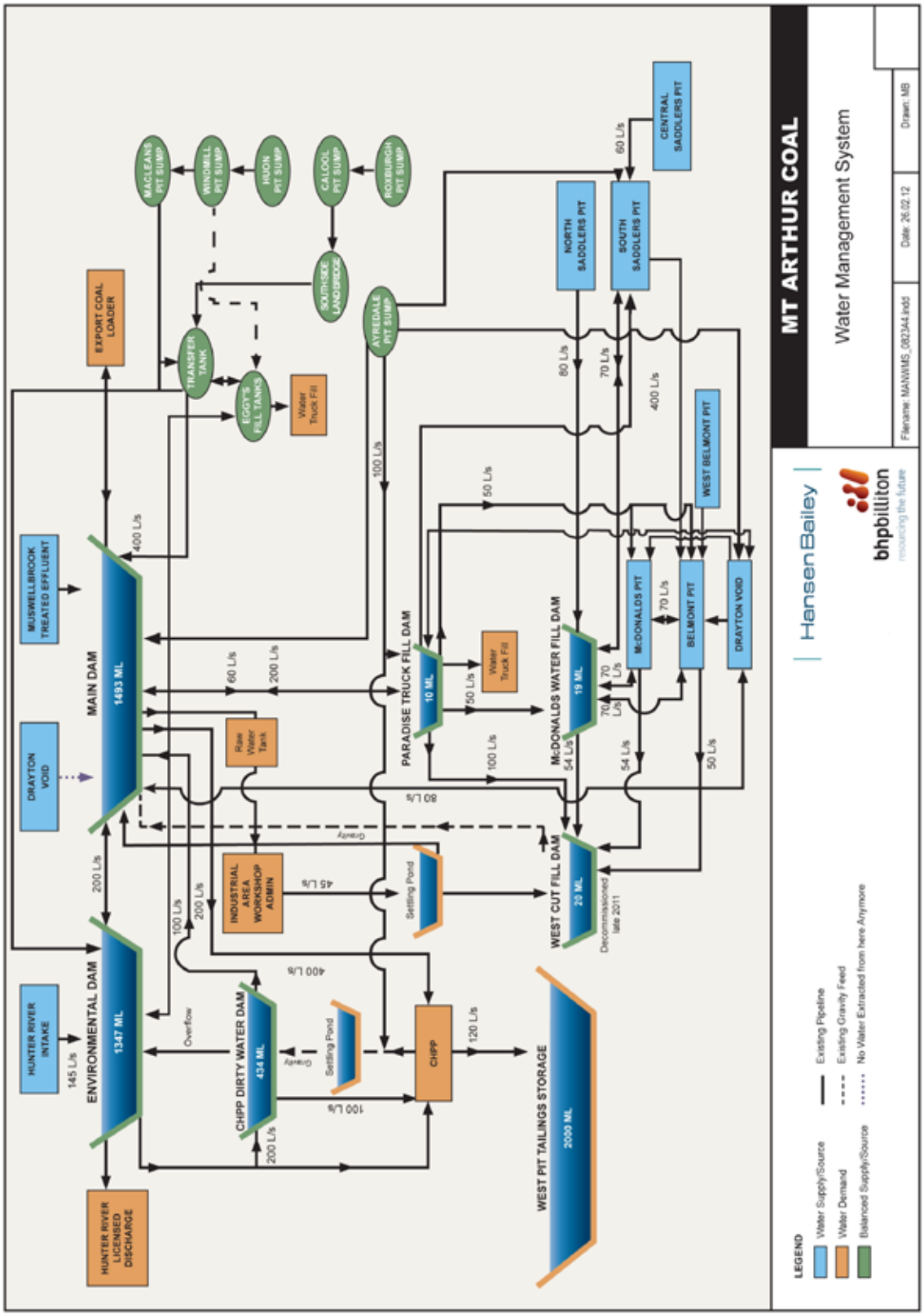


Figure 27: Mt Arthur Coal Water Management System 2011

Mt Arthur Coal received 884.9 ML of recycled water from the MSC as part of the treated effluent reuse scheme, which accounted for approximately 8 per cent of all water sourced during the year. This was an increase on the 2010 result. The treated effluent reuse scheme will continue to be an important recycled water source for the operation during 2012.

Supplementary water from the Drayton void was used at the CHPP and for dust suppression activities to minimise water drawn from the Hunter River and pumped from other distant water storages. Work to improve pumping facilities at the Drayton void is expected to be completed in 2012.

Similar to the previous year, the CHPP was the main consumer of water at Mt Arthur Coal in 2011. Water consumption at the CHPP also increased in 2011 as a result of an increase in amount of run-of-mine coal being washed. This trend is expected to continue as the operation expands.

Mt Arthur Coal's water cart fleet was upgraded during December 2011 with the addition of two new CAT777F model water carts. Contractor and hire water carts were also used within the pit, on pre-stripping operations and on rehabilitation areas. The additional water carts and an increase in hauling distances contributed to an increase in water cart consumption in 2011 compared to the previous year.

The volume of water loss in the system due to evaporation increased in 2011 when compared to 2010. Evaporation was modelled on rainfall received on site during 2011.

In previous years, Mt Arthur Coal recorded water sources, uses and losses as part of the water balance. The water balance was revised in 2011 to include total system inputs and outputs. As a result seepage, which was previously calculated as a loss based on the total water use in water carts, and 10 per cent of water use in the industrial area is no longer reported due to double counting.

Discharge

During 2011, Mt Arthur Coal discharged water into the Hunter River from its licensed discharge point under the Hunter River Salinity Trading Scheme (HRSTS) and EPL. Water was discharged on three occasions in consecutive days in June 2011 when the river was declared to be in flood. Prior to discharging, the flow meter was calibrated, telemetry was confirmed to be operational and water quality was tested in line with procedures.

A risk review was also undertaken across the site during the year to ensure controls were in place to minimise the risk of any potential unlicensed discharges from site.

Table 17: Mt Arthur Coal water balance for 2011

Water inputs		
Pumped from the Hunter River		1399.1
Treated effluent from MSC		884.9
Rainfall and runoff captured on site		8148.0
Groundwater reporting to open cut pits		420.0
Potable water		44.6
Total		**10896.6**
Water outputs		
CHPP	Tailings and course reject	4149.0
	Product	122.4
Export stockpile sprays		18.0
Water carts		2086.0
Industrial area water use		692.4
Potable water consumption		44.6
Discharge under HRSTS		51.6
Open water evaporation		1504.0
Total		**8668.0**

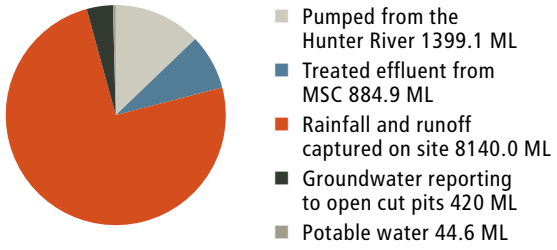


Figure 28: Mt Arthur Coal's water inputs for 2011

Table 18: Mt Arthur Coal's existing water access licences as at 31 December 2011

Category	Water access licence title reference	Share component (ML)	Issue date	Expiry date
General security	WAL524	390	19/08/2011	Perpetuity
General security	WAL651	18	2/05/2008	Perpetuity
General security	WAL690	50	12/10/2009	Perpetuity
General security	WAL828	220	2/05/2008	Perpetuity
General security	WAL918	2,510	16/06/2010	Perpetuity
General security	WAL935	150	24/01/2007	Perpetuity
General security	WAL936	150	27/11/2007	Perpetuity
General security	WAL1012	183	2/05/2008	Perpetuity
General security	WAL1041	27	2/05/2008	Perpetuity
General security	WAL1092	270	16/06/2006	Perpetuity
General security	WAL1108	360	2/05/2008	Perpetuity
General security	WAL1185	198	25/7/2011	Perpetuity
General security	WAL1187	204	25/7/2011	Perpetuity
General security	WAL8416	60	5/05/2010	Perpetuity
General security	WAL9073	325	24/08/2011	Perpetuity
General security	WAL15495	25	28/04/2010	Perpetuity
General security	WAL15496	25	15/04/2010	Perpetuity
General security	WAL15497	20	15/04/2010	Perpetuity
General security	WAL15498	90	3/02/2010	Perpetuity
General security	WAL16138	100	26/11/2008	Perpetuity
General security	WAL16139	63	14/11/2011	Perpetuity
High security	WAL577	490	3/02/2010	Perpetuity
High security	WAL827	3	2/05/2008	Perpetuity
High security	WAL917	700	2/02/2010	Perpetuity
High security	WAL934	3	16/06/2006	Perpetuity
High security	WAL1080	3	16/06/2006	Perpetuity
High security	WAL1083	800	3/02/2010	Perpetuity
High security	WAL1107	192	2/05/2008	Perpetuity
High security	WAL1184	3	25/07/2011	Perpetuity
High security	WAL1186	3	25/07/2011	Perpetuity
High security	WAL19510	400	5/11/2009	Perpetuity
Supplementary	WAL1247	87.2	12/07/2011	Perpetuity
Supplementary	WAL1248	48	12/07/2011	Perpetuity
Supplementary	WAL1277	3.2	2/05/2008	Perpetuity
Supplementary	WAL1296	152.6	14/11/2007	Perpetuity
Domestic and stock	WAL578	8	8/02/2010	Perpetuity
Domestic and stock	WAL829	8	31/03/2005	Perpetuity
Domestic and stock	WAL863	8	31/03/2005	Perpetuity
Domestic and stock	WAL1085	8	3/02/2010	Perpetuity
Groundwater	20BL171995	750	5/11/2008	4/11/2013
Groundwater	20BL168155	750	28/05/2007	27/05/2012
Groundwater	20BL171156	150	13/03/2007	Perpetuity
Groundwater	20BL170620	250	5/12/2011	4/12/2016
Groundwater	20BL171833	Monitoring	1/05/2008	Perpetuity
Groundwater	20BL169992	Monitoring	15/12/2005	Perpetuity
Groundwater	20BL169989	Monitoring	14/12/2005	Perpetuity
Aquifer	WAL18175	13	16/11/2011	Perpetuity
Aquifer	WAL18141	104	25/07/2011	Perpetuity
Aquifer	WAL18247	247	25/07/2011	Perpetuity

4. Community Relations

2011 Summary

- Developed a five-year community investment plan
- Invested in sustainable initiatives through the Community Development Fund
- Delivered an Aboriginal engagement program in Muswellbrook and the surrounding region
- Facilitated a Housing and Homelessness workshop with representatives from the housing sector
- Received a commendation in 2011 Planning Excellence Awards for the Sustainable Communities Project

Mt Arthur Coal is committed to minimising the impacts of its operation and being an active participant and contributor to sustainable community development programs that benefit local people.

Mt Arthur Coal has a comprehensive community engagement program and Community Development Fund to identify and respond to the evolving needs and issues that are important to local people. Feedback enables Mt Arthur Coal to continually refine and improve its community engagement and EMS programs.

4.1 Community Engagement

4.1.1 Communication

Mt Arthur Coal delivered a comprehensive community engagement program in 2011 that applied multiple engagement strategies and communication tools to further improve its relationship with the local community in which it operates. The program engaged stakeholders across a range of sectors including near-neighbours, local residents, regional industry and mining companies, community groups, NGOs and local, state and federal governments.

Mt Arthur Coal engaged and communicated with stakeholders through face-to-face meetings, community workshops, telephone and written correspondence, distribution of information and feedback mechanisms. Informal discussions in the workplace and around the community also contributed to the development of stakeholder relationships.

Community Matters Newsletter

Mt Arthur Coal's *Community Matters* newsletter was distributed in May 2011 to more than 7,000 households, businesses and organisations throughout Muswellbrook, Aberdeen and Denman. The newsletter provided information about Mt Arthur Coal's Sustainable Communities Project, new apprentices, mine extension project, dust suppressants, air quality monitoring and community investment activities.

The newsletter also included a brief questionnaire to capture community feedback on a range of issues, and respondents who completed the questionnaire could nominate a not-for-profit organisation to receive a $10 donation. Mt Arthur Coal donated more than $1,700 to nominated community organisations and charities as a result of 184 questionnaires returned from the community.

Community Matters can be accessed on the Mt Arthur Coal website and is provided to interested community representatives on request.

Website and Media

In 2011, Mt Arthur Coal continued to maintain its section of the BHP Billiton website to provide the community access to information about the operation including project approval material, blast schedules, CCC meeting minutes, community complaints records and environmental management plans.

During the year, Mt Arthur Coal placed advertisements and undertook a range of media activities to inform the community about its operations, projects and community investment activities.

Mt Arthur Coal's free-call 24-hour Community Response Line (1800 882 044) was maintained throughout 2011 to allow the community to contact the operation directly to ask questions or raise concerns about mining activities.

4.1.2 Consultation

Community Consultative Committee

As part of its community engagement program, Mt Arthur Coal coordinated and participated in nine Mt Arthur Coal CCC meetings in 2011. These meetings provided an opportunity for community representatives to discuss issues relating directly to Mt Arthur Coal's mining operations, environmental performance, monitoring results and community relations.

Key discussions at the Mt Arthur Coal CCC meetings during the year included:

- operational schedules, infrastructure and equipment upgrades, and processing, transport and production results;
- environmental monitoring and results;
- community investment and community relations activities;
- environmental management plans, rehabilitation activities and the rehabilitation strategy;
- updates on the mine's expansion plans.

Mt Arthur Coal was also involved in two Mt Arthur Coal and Anglo Coal (Drayton Management) Joint CCC meetings in 2011 to discuss issues surrounding rail movements, and air quality and noise monitoring results relating to the joint rail loading facility.

CCCs are operated in accordance with the DoPI *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects*, and meetings attended by employees from Mt Arthur Coal Management and Environment and Community teams, MSC representatives and local residents.

The dates of CCC meetings held during 2011 are shown in Table 19, and meeting minutes are available on the BHP Billiton website at www.bhpbilliton.com.

Table 19: Mt Arthur Coal Community Consultative Committee meetings in 2011

Mt Arthur Coal CCC
27 January 2011
23 March 2011
25 May 2011
3 August 2011 (site tour and meeting)
8 September 2011 (extraordinary meeting)
23 September 2011 (extraordinary meeting)
5 October 2011
2 November 2011 (extraordinary meeting)
7 December 2011

Mt Arthur Coal and Anglo Coal (Drayton Management) Joint CCC
17 February 2011
25 August 2011

Community Education

Site visits provide an opportunity for Mt Arthur Coal to educate the community and stakeholders about the scale and size of its mining operations and its EMS.

During 2011, Mt Arthur Coal conducted site visits for a number of stakeholders, including TAFE Upper Hunter Mining Skills Apprentices, Waverley College, St Joseph's High school students and CCC members, as well as representatives from the National Farmers' Federation, University of New England, University of Sydney, the Local Government Association of Queensland and State Government agencies.

Sustainable Communities Project

Mt Arthur Coal continued to progress and action the outcomes of its Sustainable Communities Project during 2011. This included undertaking further engagement activities and investing in a number of sustainable community development projects which aim to address cumulative impact issues and improve local quality-of-life indicators. Key activities during the year included:

- the release of the Sustainable Communities Project Summary Report;
- the delivery of an Aboriginal engagement program with more than 100 key local Aboriginal stakeholders in Muswellbrook and the surrounding region to discuss cultural heritage activities and identify possible investment opportunities and projects;
- a workshop to discuss issues of homelessness and housing stress within the Upper Hunter area;
- completion of Mt Arthur Coal's five-year community investment plan.

Mt Arthur Coal also hosted an open community event in Muswellbrook in December 2011, which was attended by more than 130 local community members and representatives. At the event, Mt Arthur Coal provided information about its current investment activities and the projects being developed with local organisations which may be supported in the future. The event provided participants with the opportunity to provide feedback about how well they think local issues are being addressed and what else has to be done.

Muswellbrook South Public School Aboriginal Dance Group performing at the 2011 open community event

Based on feedback received at the event, Mt Arthur Coal is performing well with its support for local education and childcare programs, community development initiatives and projects to support the Aboriginal community. Opportunities for improvement included housing, infrastructure and the arts.

Mt Arthur Coal will continue to work with community organisations, as well as other mining companies, government and business, to develop projects which address these and other impacts and deliver local priorities.

Acknowledging the achievements of the Sustainable Communities Project, Mt Arthur Coal was awarded a Commendation at the 2011 New South Wales Planning Excellence Awards for Public Engagement and Community Planning. The award recognises the best-practice and innovative approach to public engagement and social planning undertaken by Mt Arthur Coal to achieve high quality community participation.

4.1.3 Employee Participation

During 2011, Mt Arthur Coal again set Community Citizenship key performance indicators (KPIs), for more than 260 of its managers, supervisors, engineers and administrative staff. This KPI encourages employees to be involved in community development activities and to support local organisations in need by volunteering their time at local community events.

Mt Arthur Coal representatives also attended a number of community events sponsored through the Community Development Fund. The events and activities supported and attended by Mt Arthur Coal employees during the year are shown in Table 20.

Table 20: Events and activities supported and attended by Mt Arthur Coal employees in 2011

Aberdeen Highland Games
Black Coal Cup Golf Day
Bursting with Energy Expo
Clean up Australia Day
Denman Food and Wine Affair
Denman Pool 2011 season opening
Denman Sandy Hollow Junior Rugby League Football Club home games
Hunter Valley Group 21 Rugby League Referees' Association Annual Dinner
Koora Industries Morning Tea
Mt Arthur Coal Muswellbrook Gold Cup Race Day
Mt Arthur Coal Scone Horse Trials
Muswellbrook Carnivale Spring Fun Run
Muswellbrook Community Christmas Carols
Muswellbrook High School Agricultural area fencing project
Muswellbrook High School Gifted and Talented Students Program
Muswellbrook High School mock interviews
Muswellbrook Police and Community Youth Club 2011 Christmas Appeal
Muswellbrook Shire Council Solar Boat Challenge
Muswellbrook South Public School uniform presentation
National Tree Day
Roger St Primary School Fete
Scone High School Annual Presentation
St Catherine's Catholic College Annual Presentation
St Heliers Heavy Horse Field Day
St James School Annual Presentation
Technical assistance for Riding for the Disabled
Vietnam Remembrance Day Service

4.2 Community Investment

In late 2010, Mt Arthur Coal announced its intention to invest $4 million in the local community in 2010-11, and commenced the Sustainable Communities Project to ensure these funds were spent where they were most needed. However, during the Sustainable Communities Project Mt Arthur Coal identified that numerous community organisations were potentially unable to deliver and manage key community investment projects due to internal resource constraints and capacity issues which prevented all of the funds being distributed as planned.

As a result, Mt Arthur Coal invested approximately $2.6 million in community development activities and initiatives and the implementation of the Sustainable Communities Project through its Community Development Fund, as shown in Table 21. In addition, Mt Arthur Coal has committed $2.1 million to projects which will benefit the local community, but are yet to be commenced.

Investment during the year focused on projects that address cumulative impact issues, improve the local quality-of-life, increase the community capacity of local organisations and deliver sustainable community development outcomes in the local community. Key investment areas included education, health, environment, community development, arts and culture, sport and recreation and community development initiatives, as shown in Figure 29. This included providing financial funding, volunteers and in-kind support to a range of organisations and activities.

To address the issue of community capacity, Mt Arthur Coal is working alongside educational, health, housing and government sector groups to scope a number of community development and investment projects. As part of this approach, in 2011 Mt Arthur Coal worked with:

- MSC to scope the need for a community development worker to enhance capacity in the Muswellbrook community;
- MSC to develop a children's services plan for the Muswellbrook Local Government Area;
- Upper Hunter Community Services to develop a community development strategy for the South Muswellbrook public housing community;
- Muswellbrook Women's and Children's Refuge to scope the need for housing services to support women and children in Muswellbrook.

To support these scoping activities Mt Arthur Coal is providing funding for specialist consultation services and planning resources to enable community groups to establish sustainable project proposals that may be submitted to Mt Arthur Coal or other funding organisations for consideration. Anticipated funding for these projects has been rolled over into the 2011 to 2012 budget. These and other projects will continue to be scoped and evaluated in 2012.

During 2011, Mt Arthur Coal also sponsored a number of organisations through the Community Development Fund, which are listed in Table 22.

Central to Mt Arthur Coal's commitment to invest in the local community is a voluntary planning agreement (VPA) with MSC. Established as a requirement under the *Environmental Planning and Assessment Act 1979*, the VPA is designed to ensure that Mt Arthur Coal contributes to public amenities or services that may be impacted by the growth of its mining operations.

Shown in Table 21, through the VPA, Mt Arthur Coal has committed to providing:

- $7.1 million ($3.1 as a direct contribution over two years and $4 million as a loan) towards the upgrade of Thomas Mitchell Drive, which is expected to commence in 2012;
- $120,000 each year to MSC for ongoing upgrades and maintenance of Thomas Mitchell Drive;

- $500,000 to MSC for the Mt Arthur Coal Community Development Fund which will support projects which have an economic, social or environmental benefit for the community;
- $20,000 each year to MSC for ongoing environmental monitoring or environmental assessments within the Muswellbrook Local Government Area.

During the year, Mt Arthur Coal also contributed towards the maintenance of the Muswellbrook Heated Pool.

Gifts donated by Mt Arthur Coal employees to the 2011 St Vincent de Paul Christmas Appeal

4.2.1 Community Partnerships

Mt Arthur Coal has established long-term partnerships with a number of community organisations and activities that support sustainable community development. Community sponsorship agreements are developed for each partnership and projects are evaluated annually to ensure the objectives and deliverables outlined in the agreements were achieved. Mt Arthur Coal's community partnerships are included in Table 22.

4.2.2 BHP Billiton Matched Giving Program

The BHP Billiton Matched Giving Program financially matches the contributions that its employees make to charity and not-for-profit organisations through volunteering, fundraising or personal donations. Each year, individual employees are entitled to claim up to $50,000 of matched funds through the Matched Giving Program. During 2011, Mt Arthur employees continued to organise and participate in fundraising events and activities that are eligible to be matched through the program. Awareness of the program has also increased across the operation.

In 2011, Mt Arthur Coal donated $307,708 to over 70 different charities and not-for-profit organisations through the BHP Billiton Matched Giving Program. Significant matched-giving initiatives included more than $139,000 for the Children's Cancer Institute Australia, made possible by the efforts of a number of employees organising a fundraising dinner in March 2011, and $42,000 for the Queensland Premier's Disaster Relief Fund.

Table 21: Summary of Mt Arthur Coal community investment in 2011

Activity or project	Spend in 2010-11
Sponsorships and donations	$873,100
Community engagement and operating costs (consultants and research, wages engagement activities, capacity building activities, community support costs)	$1,139,664
Mt Arthur Coal Community Fund (VPA)	$500,000
Muswellbrook Heated Pool maintenance contribution (VPA)	$100,000
MSC environmental assessment contribution (VPA)	$20,000
Thomas Mitchell Drive upgrade (VPA)*	$1,500,000
Early childhood learning initiative (letter of intent)**	$620,000
Total spend 2010-11	$2,632,764
Total rolled over into 2011-12	$2,120,000

Note: this does not include matched giving spend.
** Rolled over into 2012-13 budget pending submission of works plan MSC.*
*** Investment pending approval of funds from other organisations.*

Table 22: Community Development Fund recipients in 2011

Aberdeen Highland Games	Muswellbrook Junior Rugby League
Aberdeen Public School	Muswellbrook Race Club Limited
Aberdeen State Emergency Services	Muswellbrook Shire Council
Australian Local Government Women's Association	Muswellbrook Show Committee
Christian Social Centre	Muswellbrook South Public School
Denman Amateur Swimming Club	Muswellbrook Touch Association
Denman Chamber of Commerce+	Muswellbrook Women's and Children's Refuge
Denman Hospital Auxiliary	Scone High School
Denman Pony Club	Scone Horse Trials committee+
Denman Public School	Singleton Diggers
Denman Sandy Hollow Junior Rugby League Football Club	St Catherine's High School Singleton
Global Care	St Joseph's School Denman
Graham Polly Farmer Foundation+	St Mary's School
St Heliers Heavy Horse Field Day	TransCare Hunter Ltd
Hunter Life Education+	Upper Hunter Community Services
Hunter Valley Group 21 Rugby League Referees' Association	Upper Hunter District Bowling Association
Industry and Investment NSW	Upper Hunter Drug and Alcohol Service
Joblink Plus	Upper Hunter Education Fund+
Koora Industries	Upper Hunter Learning Centre
Lifeline Newcastle and Hunter+	Upper Hunter Motorcycle Club
Moobi School Community Site	Upper Hunter Motoring Association
Muscular Dystrophy Association	Wanaruah Local Aboriginal Lands Council
Muswellbrook Amateur Theatrical Society	Westpac Rescue Helicopter Service
Muswellbrook and Districts Camera Club	Wildlife Aid Incorporated
Muswellbrook High School+	

+ *Community investment partnership.*

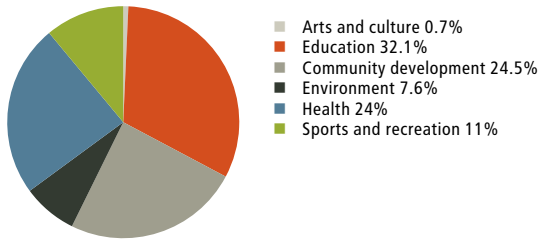


Figure 29: Distribution of Mt Arthur Coal's community investment in 2011

4.3 Complaints

Complaints Procedure

As part of its EMS, Mt Arthur Coal has a procedure for receiving, investigating, responding and reporting complaints received from the community. Mt Arthur Coal invites the community to provide feedback about its operations through a free-call 24-hour Community Response Line (1800 882 044), which is advertised in the local phone directory, newspapers and *Community Matters* newsletter and at www.bhpbilliton.com.

When complaints are received they are immediately investigated and, where possible, a response is provided to the complainant. Observations and learnings from complaint investigations are incorporated into mine planning and environmental management as appropriate to minimise the potential of the issue reoccurring. Complaint details are also recorded in a database for review within the organisation and reported regularly to CCCs, government agencies and the community.

Results

In 2011, Mt Arthur Coal received 91 complaints from community members and near-neighbours, compared to 49 complaints in 2010. A summary of the complaints received is provided in Figures 30 and 31, and a complete register of complaints can be found in Appendix 9.

Blasting activities, including blast vibration, overpressure, dust and fume, accounted for 41 complaints during the year, accounting for 45 per cent of the total complaints received. Mt Arthur Coal received more complaints related to blasting activity in 2011 than in the previous year due to an increase in blasting in the northern end of the mine which is close to neighbouring residents.

The increase in blasting complaints may also reflect an increase in community concern about the impact of vibration, dust and fume from blasting activities. To address community concerns, Mt Arthur Coal implemented mitigation measures to minimise blasting impacts on the surrounding community, which are discussed in section 3.1.3.

On 10 occasions during the year there was more than one complaint received about a single blast activity. On each of these occasions the blast occurred in the most northern area of the pit in close proximity to Denman Road. Investigations conducted after each complaint verified that blast monitoring results were within statutory limits.

In 2011, Mt Arthur Coal received 14 dust complaints, an increase on previous years. In each case, real-time air quality monitoring results were within statutory limits and appropriate control measures were in place. The air quality management measures undertaken by Mt Arthur Coal in 2011 are discussed in section 5.2.

Mt Arthur Coal received 26 complaints related to noise in 2011, compared to 9 complaints in 2010. Thirteen of these complaints were from a single resident on Roxburgh Road concerned about a low frequency mining noise. Discussions were held with neighbouring mines and investigations conducted in an attempt to determine and address the source of this noise. Real-time monitoring at the time of each complaint showed that noise levels from Mt Arthur Coal were within statutory limits.

Seven lighting complaints were received from residents or motorists on Denman Road, Edderton Road, Roxburgh Road and Thomas Mitchell Drive in 2011, compared to four complaints in 2010. In cases where complaints were received at night, Mt Arthur Coal's lighting plants were immediately redirected or relocated to address the complainant's concern.

During 2011, Mt Arthur Coal received one complaint regarding spontaneous combustion, and areas prone to outbreaks were capped and regularly inspected. One complaint was received regarding the presence of the weed species St John's Wort predominantly within the Mt Arthur Coal rail loop. The affected areas were treated using Grazon Extra and will continue to be monitored and treated as required. One complaint was also received regarding a road closure due to blasting.

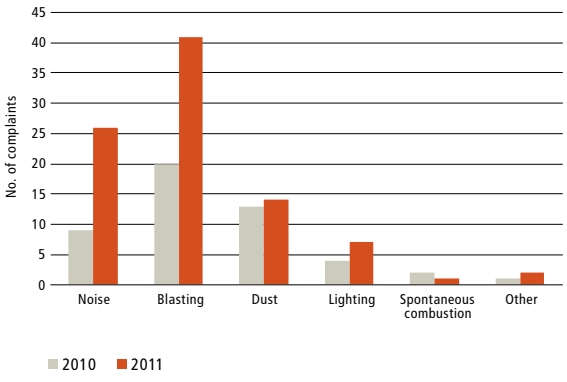


Figure 30: Summary of complaints received by Mt Arthur Coal by issue in 2011

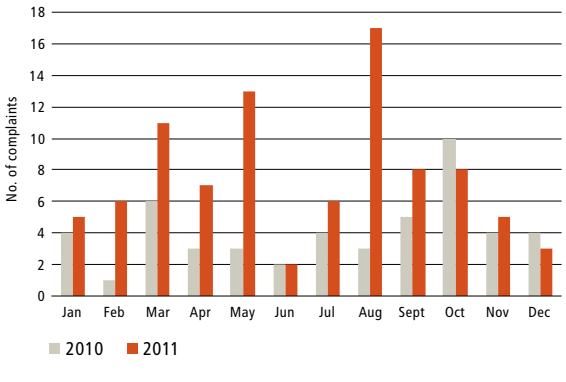


Figure 31: Summary of complaints received by Mt Arthur Coal by month in 2011

5. Legal Compliance and Other Requirements Review

2011 Summary

- Maintained high levels of regulatory compliance during the year
- Received zero government fines and penalties
- Maintained international standards certification for the EMS
- Surrendered project approvals that were consolidated in September 2010
- Referred future operational areas under the *Federal Environment Protection and Biodiversity Conservation Act 1999*

Mt Arthur Coal has a system to identify, manage, assess and report legal compliance against requirements, which is managed by the Environment and Community team. This system includes EMS procedures, checklists, inspections and audits.

5.1 Monitoring Systems

Legal compliance is monitored on a continual basis from analysis of monitoring and other data, maintenance of compliance checklists and a system of regular audits and inspections. As part of this system, areas of non-compliance are promptly identified and actioned.

Inspections may also be conducted on an ad-hoc basis by government authorities, including DTIRIS, DoPI, NOW, MSC and CCCs, to assess, among other matters, performance against legal and other requirements. In particular, scheduled and non-scheduled inspections of Mt Arthur Coal's operations have been undertaken by DoPI's new Singleton-based compliance officers throughout the year.

Consistent with EMS procedures, any changes to legal requirements such as new approvals or changes to legislation are monitored by the Environment and Community team. These changes may be identified from research, industry contact, correspondence from NGOs, government notifications, subscriptions, media articles and legal advice.

Mt Arthur Coal's EMS framework, procedural and training documentation is also reviewed on an ongoing basis and is updated as required to reflect changes in legal requirements. In 2011, the environmental management plans that support the EMS framework were updated and provided to DoPI for approval in accordance with timing outlined in the project approval.

5.2 Results

Annual AEMR and Compliance Review

A review of compliance against legal requirements is required on an annual basis during the preparation of the AEMR. In 2011, Mt Arthur Coal achieved a high level of compliance against approval conditions and legislation applicable to the site.

Mt Arthur Coal maintains regular communication with NSW Government agencies including DTIRIS, DoPI, OEH and MSC to ensure that improved levels of effective assessment and reporting continue. On the 23 May 2011, DoPI conducted a review of the 2010 AEMR to ensure it complied with Condition 3, Schedule 5 of the Mt Arthur Coal Mine Open Cut Consolidation Project Approval. Overall, DoPI reported that the AEMR satisfied the requirements of the project approval. The department also suggested some improvements, which have been incorporated into the 2011 AEMR (see Table 23).

Table 23: DoPI action plan from the 2010 AEMR review

Issue	Action required	Response
Include a Compliance Audit Table for the conditions in PA 09_0062 in 2011 AEMR	Input a Compliance Audit Table into Chapter 5 Legal Compliance and Other Legal Requirements	See Table 3 in section 2.4.2 Legal Requirements.
Audit Mt Arthur Coal's website	Audit the website content for compliance against Condition 11, Schedule 5 of PA 00-0062	The website audit was undertaken in early 2012 and the site was compliant for all applicable areas. The results of this audit are displayed in Table 24.
Water Balance	Include an explanation of water loss through seepage	The water balance was revised in 2011 to include total system inputs and outputs. As a result, seepage which was previously calculated as a loss based on the total water use in water carts and ten per cent of the water use in the industrial area is no longer reported due to double counting.
Rehabilitation Diagram	The diagram was difficult to read and needs to be larger	The rehabilitation diagram is presented as an A3 fold out page in Appendix 6, and will be provided as separate plans to government departments.
Spontaneous Combustion	Report on progress in management of spontaneous combustion in the sub-lease area	A summary of Mt Arthur Coal's actions in response to identified issues is provided in Section 3.10.3.
Denman Road Visual Bund	Ensure the progress of vegetation implementation plan for the visual bund	Reference to the visual bund vegetation management is provided in section 3.9.1 and section 3.11.2.

Table 24: Results of the 2011 Mt Arthur Coal website audit

Website requirement	Compliant	Comments
A copy of all current statutory approvals for the project	Yes	A copy of the Mt Arthur Coal Mine Open Cut Consolidation Project Approval 09_0062, the Mt Arthur Underground Project Approval 06_0091 and the Bayswater No. 3 Development Consent are available. All surrendered statutory approvals were removed from the website in late 2011.
A copy of the current environmental management strategy and associated plans and programs	Yes	All management plans and strategies required by the Mt Arthur Coal Mine Open Cut Consolidation Project Approval 09_0062 that are approved by DoPI or submitted for approval are available.
A summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval	Yes	Monitoring results since July 2010 are available through the documents titled 'CCC Meeting – Monitoring Results'.
A complaints register, which is to be updated on a monthly basis	Yes	Monthly reports of community complaints since November 2010 are available.
A copy of the minutes of CCC meetings	Yes	Mt Arthur Coal CCC meeting minutes since September 2010 are available.
A copy of any Annual Reviews (over the last 5 years)	Yes	Annual Environmental Management Reports since 2009 are available.
A copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit;	N/A	Not applicable – the independent environmental audit was not finalised at the end of 2011.
Any other matter required by the Director-General	N/A	Not applicable – no requests have been made by the Director-General.

The website also contains information relevant to EPL requirements as necessary and SEWPAC requirements relating to the referral lodged under the EPBC Act.

Annual Surveillance Audit

To maintain EMS certification against ISO14001, an annual surveillance audit was undertaken by Det Norske Veritas (DNV) on 15 and 16 June 2011. Mt Arthur Coal retained certification as a result of the audit findings, and additional information on the findings can be found in section 2.4.5.

Independent Environmental Audit

An independent environmental audit was commenced in December 2011 and will be completed in early 2012. The lead auditor is Trevor Brown of Trevor Brown and Associates, who has been approved by the Director General of DoPI as required by the conditions of the Mt Arthur Coal Mine Open Cut Consolidation Project Approval.

Other specialists in the audit team include:

- Michael Frankcombe – surface water and rehabilitation specialist;
- Will Wright – groundwater specialist;
- Aleks Todoroski – air quality specialist;
- Neil Pennington – noise specialist.

Air Quality Management and Performance

In 2010, Katestone undertook the *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining*. On 19 April 2011, a review was conducted by PAE Holmes and Glade Consulting to compare Mt Arthur Coal's current dust controls against best practice identified in the Katestone Report.

The Katestone Report identified the methods used by Mt Arthur Coal to minimise emissions of particulate matter based on information contained in the AEMR, environmental management plans and site visits. The review of the Katestone Report identified that there were a number of noteworthy management techniques implemented at Mt Arthur Coal that assist in the management of particulate matter emissions that were not included.

The review noted that Mt Arthur Coal has adopted many elements of best practice control to mitigate particulate matter emissions across all key activities assessed in the Katestone Report. Based on the metrics calculated and reported in the Katestone report, Mt Arthur Coal was among the best performing open-cut coal mines for implementation of haul road mitigation measures.

In August 2011, a pollution reduction program to assess performance against the Katestone benchmarking study was added to Mt Arthur Coal's EPL. Mt Arthur Coal will complete and lodge this study with OEH in early 2012, and implement any actions to address best practice control measures identified as a result of the review.

6. Performance against 2011 Targets and Proposed 2012 Targets

Apprentice electrician, Timothy Keast

6.1 Monitoring Systems

Mt Arthur Coal is committed to delivering a high standard of environmental and social performance into the future, and has established targets to be achieved over the next reporting period. These targets will be closely monitored throughout 2012 and an update on the status of each will be reported in the 2012 AEMR.

6.2 Performance against 2011 Targets

Mt Arthur Coal's commitment to a high standard of performance ensured 80 per cent of targets were achieved during the last reporting period. The remaining 20 per cent of targets have been carried over to 2012. Table 25 outlines the performance of Mt Arthur Coal on each target set for the 2011 year.

Highlights in 2011 included the completion of a number of key facilities and upgrades to enable growth of the operation; the review of management plans which assisted in continued successful audit outcomes; and consultation with Aboriginal stakeholder groups to support land management at Mt Arthur Coal. Work also began on the two remaining targets proposed during 2010, with completion of these projects postponed until 2012.

6.3 Proposed 2012 Targets

Mt Arthur Coal has established the following targets for 2012:

- review and update the site predictive water balance model simulation tool;
- investigate the feasibility of dust reduction projects identified in the Pollution Reduction Program report;
- continue investigating a rehabilitation trial on landform design;
- install a new real-time air quality monitor to the north of the site for dust management purposes;
- install a real-time noise monitor to assist in the management of noise impacts at nearby properties;
- install a real-time surface water monitoring station downstream of Mt Arthur Coal in Saddlers Creek, but upstream from any water off-takes;
- complete and lodge an environmental assessment for the Mt Arthur Coal Modification Project with DoPI for approval;
- commence a review of the effectiveness of the complaints handling process;
- employ at least eight first-year apprentices.

Targets specifically related to the proposed amount of land to be rehabilitated and disturbed in 2011 are provided in Table 15 in section 3.9.1. A rehabilitation plan showing completed and proposed areas of rehabilitation is also provided in Appendix 6.

6. Performance against 2011 Targets and Proposed 2012 Targets continued

Table 25: Explanation of Mt Arthur Coal's 2011 performance against targets set in 2010

Target	Achieved	2011 Performance
Proposed areas of rehabilitation and disturbance	No	Performance is outlined in Table 15. Rehabilitation was undertaken at VD1 and CD1. Rehabilitation of Saddlers SD2 dump was delayed to allow for feasibility studies into best practice rehabilitation to be undertaken. In the interim, Saddlers SD2 dump was aerial seeded to minimise windblown dust generation and excessive erosion.
Completion of the MAC20 Project, which involves upgrades to the CHPP facility and industrial area to manage the increase in export capacity required for expansion of operations	Yes	MAC20 Project was completed in 2011.
In consultation with DoPI, surrendering of the Mt Arthur North, Bayswater No. 3, Rail Loading Facility and South Pit Extension development consents, following the approval of the Mt Arthur Coal Consolidation Project	Yes	The surrender of the Mt Arthur North, Rail Loading Facility and South Pit Extension development consents was accepted by DoPI on 7 November 2011. DoPI also approved the postponement of the surrender of the Bayswater No. 3 consent.
Review of all management plans required in the Mt Arthur Coal Mine Open Cut Consolidation Project Approval	Yes	All required management plans due in 2011 were reviewed and submitted to DoPI for approval during 2011.
Consultation with Aboriginal groups regarding the new Aboriginal cultural heritage offset area	Yes	An Aboriginal cultural heritage barbecue was held at the Muswellbrook Regional Arts Centre on 10 June 2011. Group discussion was facilitated regarding cultural heritage concerns, land management concerns, preferred Aboriginal community involvement mechanisms, an Aboriginal committee or working group, a Keeping Place, a teaching facility and training activities. Aboriginal stakeholders were interviewed prior to the cultural heritage barbecue to gain a preliminary sense of Aboriginal community aspirations and concerns regarding cultural heritage and potentially contentious issues. This enabled the development of a strategic approach to facilitating the barbecue to ensure the best outcomes for both the Aboriginal community and Mt Arthur Coal.
Installation of a new real-time air quality monitor at the Mt Arthur Coal complex to provide data representative of air quality conditions on site and at nearby properties	Yes	A real-time air quality monitor was installed at Edderton homestead to measure impacts to the south west of the operation.
Revision of the biodiversity offset strategy to include additional offset areas	Yes	Additional offset areas are being explored and a rehabilitation and biodiversity management plan is due to be completed in 2012.
Preparation of a rehabilitation strategy to define rehabilitation objectives for Mt Arthur Coal and investigate options for the future use of disturbed areas	Yes	A rehabilitation strategy has been completed and submitted to DoPI for approval.
Completion of a visual impact assessment to identify privately-owned land that could experience visual impacts from the Mt Arthur Coal complex and the mitigation measures that could be implemented to reduce these	Yes	A visual impact report was prepared and lodged with DoPI for approval in 2011.
Installation of a real-time surface water monitoring station to be located downstream of Mt Arthur Coal in Saddlers Creek, but upstream from any water off-takes	Postponed to 2012	The site and equipment has been selected for the real-time surface water monitoring station. Purchase and installation is currently being organised to align with budget during the first half of 2012.
Employment of at least eight first-year apprentices	Yes	Mt Arthur Coal welcomed nine new apprentice electricians and plant mechanics to its operations in 2011. The apprentice intake continues Mt Arthur Coal's long and proud tradition of employing and training local people for local jobs, with all of the new starters recruited from areas within the Hunter Valley including Muswellbrook, Singleton, Denman and Branxton.

Appendices

Appendix 1 – Train Movements

Destination: Port of Newcastle (all movements)

Date	No. of trains	No. of train movements	Tonnes Lodaed
1/01/11	6	11	43,025
2/01/11	5	11	34,950
3/01/11	5	10	35,913
4/01/11	8	15	57,321
5/01/11	8	17	57,555
6/01/11	6	12	42,944
7/01/11	7	14	50,610
8/01/11	9	17	65,474
9/01/11	7	15	50,475
10/01/11	6	12	43,468
11/01/11	7	14	50,725
12/01/11	6	12	43,474
13/01/11	4	8	28,896
14/01/11	3	5	21,528
15/01/11	7	14	49,796
16/01/11	7	15	50,052
17/01/11	6	12	43,823
18/01/11	5	10	36,858
19/01/11	6	12	43,669
20/01/11	4	8	28,562
21/01/11	7	14	50,484
22/01/11	7	13	50,434
23/01/11	6	12	43,878
24/01/11	7	15	50,204
25/01/11	6	11	43,292
26/01/11	6	13	43,476
27/01/11	9	18	66,196
28/01/11	6	12	43,610
29/01/11	5	9	36,109
30/01/11	7	14	50,756
31/01/11	8	17	58,781
1/02/11	5	10	35,890
2/02/11	5	10	35,890
3/02/11	3	6	21,526
4/02/11	6	11	43,068
5/02/11	4	9	28,712
6/02/11	5	10	35,890
7/02/11	7	14	50,246
8/02/11	4	8	28,712
9/02/11	6	12	43,068
10/02/11	7	14	50,246
11/02/11	9	17	64,602
12/02/11	6	12	43,068
13/02/11	9	19	64,602
14/02/11	6	12	43,068
15/02/11	9	17	64,602
16/02/11	6	12	43,068
17/02/11	5	11	35,890
18/02/11	8	15	57,424
19/02/11	4	9	28,712
20/02/11	5	9	35,890
21/02/11	8	17	57,424
22/02/11	8	15	57,424
23/02/11	5	11	35,890
24/02/11	8	15	57,424
25/02/11	7	15	50,330
26/02/11	8	16	57,424
27/02/11	5	10	35,890
28/02/11	0	0	0
1/03/11	6	12	43,068
2/03/11	7	13	50,246
3/03/11	7	15	50,246
4/03/11	8	15	57,230
5/03/11	7	14	50,052
6/03/11	9	19	64,602
7/03/11	6	12	42,874
8/03/11	9	17	63,632
9/03/11	6	13	42,874
10/03/11	8	15	57,430
11/03/11	4	9	28,685
12/03/11	8	16	57,230
13/03/11	9	17	64,828
14/03/11	3	7	21,340
15/03/11	0	0	0
16/03/11	0	0	0
17/03/11	0	0	0
18/03/11	0	0	0
19/03/11	0	0	0
20/03/11	2	3	13,931
21/03/11	4	9	28,695
22/03/11	6	11	42,931
23/03/11	7	14	50,082
24/03/11	9	19	64,273
25/03/11	8	16	56,626
26/03/11	8	15	57,382
27/03/11	10	20	72,062
28/03/11	5	11	36,095
29/03/11	6	12	43,176
30/03/11	6	12	43,296
31/03/11	4	7	28,601
1/04/11	7	14	50,804
2/04/11	5	11	35,943
3/04/11	9	17	63,996
4/04/11	10	21	71,445
5/04/11	6	12	42,746
6/04/11	9	17	65,048
7/04/11	7	14	50,927
8/04/11	6	13	43,333
9/04/11	7	14	50,133
10/04/11	8	15	57,762
11/04/11	8	16	57,860
12/04/11	6	12	42,076
13/04/11	6	13	43,130
14/04/11	8	15	57,100
15/04/11	9	18	64,877
16/04/11	9	18	65,679
17/04/11	10	20	72,039
18/04/11	6	12	43,199
19/04/11	7	15	50,212
20/04/11	5	9	35,968
21/04/11	5	10	35,890
22/04/11	4	8	28,712
23/04/11	7	14	50,643
24/04/11	10	20	72,321
25/04/11	6	13	43,245
26/04/11	5	10	35,890
27/04/11	7	13	50,168
28/04/11	5	11	35,860
29/04/11	4	8	28,725
30/04/11	0	0	0
1/05/11	5	9	36,225
2/05/11	5	10	35,911
3/05/11	6	12	43,197
4/05/11	4	9	29,270

Date	No. of trains	No. of train movements	Tonnes Lodaed
5/05/11	6	12	43,615
6/05/11	5	10	35,582
7/05/11	7	13	50,394
8/05/11	8	17	57,534
9/05/11	6	11	43,272
10/05/11	3	7	21,594
11/05/11	2	3	14,028
12/05/11	6	12	42,763
13/05/11	5	11	36,049
14/05/11	6	12	43,480
15/05/11	7	14	51,019
16/05/11	5	10	36,072
17/05/11	0	0	0
18/05/11	0	0	0
19/05/11	0	0	0
20/05/11	2	4	14,290
21/05/11	4	7	28,323
22/05/11	2	4	14,289
23/05/11	2	5	14,356
24/05/11	2	3	14,278
25/05/11	7	15	50,371
26/05/11	5	9	35,580
27/05/11	4	9	28,601
28/05/11	4	8	28,126
29/05/11	5	10	35,471
30/05/11	6	11	43,133
31/05/11	5	11	35,875
1/06/11	4	8	29,137
2/06/11	5	10	36,805
3/06/11	3	6	21,429
4/06/11	7	14	50,061
5/06/11	6	12	42,856
6/06/11	6	11	42,730
7/06/11	5	11	36,089
8/06/11	9	17	64,409
9/06/11	8	16	57,302
10/06/11	6	13	43,624
11/06/11	6	12	43,592
12/06/11	7	14	50,977
13/06/11	9	18	64,745
14/06/11	4	8	29,155
15/06/11	11	21	79,406
16/06/11	7	14	50,311
17/06/11	5	11	36,328
18/06/11	4	7	28,733
19/06/11	3	7	21,498
20/06/11	5	10	36,014
21/06/11	0	0	0
22/06/11	4	8	28,914
23/06/11	1	2	7,350
24/06/11	4	8	28,976
25/06/11	3	6	21,694
26/06/11	0	0	0
27/06/11	3	6	21,452
28/06/11	4	7	28,482
29/06/11	1	3	7,170
30/06/11	5	9	35,575
1/07/11	6	13	43,072
2/07/11	3	6	21,765
3/07/11	6	11	43,372
4/07/11	9	18	64,955
5/07/11	5	11	36,094
6/07/11	6	11	43,283
7/07/11	9	18	64,742
8/07/11	10	19	72,411
9/07/11	4	10	28,821
10/07/11	7	13	50,586
11/07/11	3	6	21,628
12/07/11	3	6	21,792
13/07/11	3	6	21,789
14/07/11	4	9	28,914
15/07/11	4	8	29,104
16/07/11	1	2	7,120
17/07/11	8	15	57,115
18/07/11	8	16	57,187
19/07/11	8	15	57,860
20/07/11	0	2	0
21/07/11	0	0	0
22/07/11	4	7	28,713
23/07/11	11	21	79,327
24/07/11	5	10	36,131
25/07/11	6	13	43,091
26/07/11	4	9	28,747
27/07/11	1	2	7,182
28/07/11	3	5	21,305
29/07/11	4	8	28,762
30/07/11	5	10	36,018
31/07/11	8	16	57,372
1/08/11	7	15	50,697
2/08/11	6	12	42,742
3/08/11	5	10	36,303
4/08/11	6	11	42,930
5/08/11	6	13	42,961
6/08/11	7	13	50,779
7/08/11	9	18	63,904
8/08/11	9	19	64,552
9/08/11	0	0	0
10/08/11	0	0	0
11/08/11	0	0	0
12/08/11	0	0	0
13/08/11	0	0	0
14/08/11	0	0	0
15/08/11	0	0	0
16/08/11	0	0	0
17/08/11	4	8	28,572
18/08/11	5	10	35,858
19/08/11	7	13	49,783
20/08/11	5	11	36,468
21/08/11	8	16	57,330
22/08/11	5	10	35,840
23/08/11	4	6	28,743
24/08/11	2	5	14,376
25/08/11	6	12	42,961
26/08/11	6	12	43,227
27/08/11	7	15	50,440
28/08/11	7	14	50,470
29/08/11	7	14	49,587
30/08/11	6	11	43,128
31/08/11	6	12	43,187
1/09/11	6	13	42,682
2/09/11	7	14	50,348
3/09/11	5	10	35,708
4/09/11	7	12	50,037
5/09/11	4	10	28,244

Appendix 1 – Train Movements continued

Date	No. of trains	No. of train movements	Tonnes Lodaed
6/09/11	7	13	50,207
7/09/11	6	11	42,862
8/09/11	5	11	35,695
9/09/11	7	13	50,070
10/09/11	6	13	42,708
11/09/11	9	18	64,232
12/09/11	3	7	21,206
13/09/11	6	12	42,118
14/09/11	6	12	42,863
15/09/11	4	8	28,769
16/09/11	3	4	21,311
17/09/11	5	12	35,209
18/09/11	4	8	28,554
19/09/11	9	16	64,378
20/09/11	7	15	50,017
21/09/11	5	10	35,699
22/09/11	3	6	21,687
23/09/11	4	9	28,866
24/09/11	7	13	50,482
25/09/11	7	15	50,847
26/09/11	5	9	35,963
27/09/11	6	12	43,144
28/09/11	5	10	35,619
29/09/11	5	10	35,935
30/09/11	8	16	57,311
1/10/11	5	10	35,526
2/10/11	5	11	36,005
3/10/11	3	6	21,203
4/10/11	1	2	7,198
5/10/11	0	0	0
6/10/11	0	0	0
7/10/11	3	6	21,514
8/10/11	8	14	57,161
9/10/11	6	13	42,844
10/10/11	6	11	43,146
11/10/11	4	10	28,452
12/10/11	7	14	50,437
13/10/11	3	6	21,582
14/10/11	5	10	35,960
15/10/11	8	16	57,185
16/10/11	8	15	56,827
17/10/11	5	11	35,879
18/10/11	7	13	50,149
19/10/11	3	7	21,272
20/10/11	7	14	49,940
21/10/11	4	7	28,377
22/10/11	6	13	42,714
23/10/11	4	8	28,730
24/10/11	8	16	57,449
25/10/11	5	10	35,262
26/10/11	6	11	43,400
27/10/11	8	15	57,575
28/10/11	8	16	56,723
29/10/11	8	17	56,604
30/10/11	9	18	64,240
31/10/11	7	14	50,365
1/11/11	9	18	64,525
2/11/11	6	11	44,118
3/11/11	7	15	49,792
4/11/11	5	11	35,783
5/11/11	8	14	57,056
6/11/11	7	15	50,031
7/11/11	9	18	64,478
8/11/11	7	15	50,068
9/11/11	10	19	71,893
10/11/11	7	14	50,426
11/11/11	8	16	58,082
12/11/11	8	16	57,262
13/11/11	4	9	28,510
14/11/11	7	13	50,199
15/11/11	5	11	35,876
16/11/11	4	8	28,978
17/11/11	7	13	50,399
18/11/11	5	10	36,133
19/11/11	7	13	50,291
20/11/11	3	8	21,161
21/11/11	6	12	42,540
22/11/11	0	0	0
23/11/11	0	0	0
24/11/11	1	2	7,294
25/11/11	0	0	0
26/11/11	1	0	7,251
27/11/11	5	10	35,850
28/11/11	6	12	43,050
29/11/11	5	11	36,110
30/11/11	2	3	14,724
1/12/11	5	10	35,894
2/12/11	8	15	57,698
3/12/11	5	11	35,736
4/12/11	6	12	42,891
5/12/11	8	15	57,723
6/12/11	8	17	57,692
7/12/11	6	13	43,145
8/12/11	5	9	35,468
9/12/11	7	14	50,712
10/12/11	7	14	50,189
11/12/11	4	9	28,282
12/12/11	4	7	29,007
13/12/11	5	9	35,878
14/12/11	3	8	21,534
15/12/11	3	6	21,558
16/12/11	0	0	0
17/12/11	8	14	57,360
18/12/11	5	11	36,214
19/12/11	6	13	43,774
20/12/11	8	16	58,121
21/12/11	7	13	50,899
22/12/11	8	16	57,560
23/12/11	9	17	65,107
24/12/11	4	10	28,763
25/12/11	0	0	0
26/12/11	3	4	21,444
27/12/11	6	13	43,219
28/12/11	7	15	50,643
29/12/11	7	13	50,336
30/12/11	7	15	50,501
31/12/11	9	17	64,539
Total	**1,989**	**3,977**	**14,290,404**
Maximum per day	**11**	**21**	**79,406**

Appendix 2 – BHP Billiton Policies

bhpbilliton
resourcing the future

Our Charter

We are BHP Billiton, a leading global resources company.
Our purpose is to create long-term shareholder value through the discovery, acquisition, development and marketing of natural resources.

Our strategy is to own and operate large, long-life, low-cost, expandable, upstream assets diversified by commodity, geography and market.

Our Values

Sustainability
Putting health and safety first, being environmentally responsible and supporting our communities.

Integrity
Doing what is right and doing what we say we will do.

Respect
Embracing openness, trust, teamwork, diversity and relationships that are mutually beneficial.

Performance
Achieving superior business results by stretching our capabilities.

Simplicity
Focusing our efforts on the things that matter most.

Accountability
Defining and accepting responsibility and delivering on our commitments.

We are successful when:

Our people start each day with a sense of purpose and end the day with a sense of accomplishment.
Our communities, customers and suppliers value their relationships with us.
Our asset portfolio is world-class and sustainably developed.
Our operational discipline and financial strength enables our future growth.
Our shareholders receive a superior return on their investment.

Marius Kloppers
Chief Executive Officer

September 2011

Mt Arthur Coal

bhpbilliton
resourcing the future

Sustainable Development Policy

Our approach to health, safety,environment and the community.

Mt Arthur Coal operates an open-cut coal mine and associated facilities near Muswellbrook in the Upper Hunter Valley producing coal for both the domestic and international markets. Mt Arthur Coal is a member of the Energy Coal customer sector group of BHP Billiton. The principles of this Policy are consistent with those of the BHP Billiton Sustainable Development Policy.

At Mt Arthur Coal we are committed to conducting our operations in a safe and environmentally and socially responsible manner. We aspire to achieve Zero Harm to people and to minimise our impacts on the local environment. Health, safety, environment and social responsibilities are integral to the way we operate as we strive to achieve leading industry practice.

At Mt Arthur Coal we are committed to developing, implementing and maintaining management systems for sustainable development that drive continual improvement and ensure we:

- do not compromise our safety values, and seek ways to improve the health of our workforce and the community;
- identify, assess and manage risks to employees, contractors, the environment and our host communities;
- uphold ethical business practices and meet or, where less stringent than our standards, exceed applicable legal and other requirements;
- respect and promote fundamental human rights within our sphere of influence, respecting the rights of Indigenous peoples and valuing cultural heritage;
- encourage a diverse workforce and provide a work environment in which everyone is treated fairly, with respect and can realise their full potential;
- take action within our own businesses and work with governments, industry and other stakeholders to address the challenge of climate change;
- set and achieve targets, including energy efficiency and greenhouse gas intensity, that promote efficient use of resources and include reducing and preventing pollution;
- enhance biodiversity protection by assessing and considering ecological values and land-use aspects in investment, operational and closure activities;
- engage regularly, openly and honestly with our host governments and people affected by our operations, and take their views and concerns into account in our decision-making;
- develop partnerships that foster the sustainable development of our host communities, enhance economic benefits from our operations and contribute to poverty alleviation;
- work with those involved through the lifecycles of our products and by-products to enhance environmental and social performance along the supply chain and promote their responsible use and management;
- regularly review our performance and publicly report our progress.

In implementing this Policy, we will engage with and support our employees, contractors, suppliers, customers, business partners and host communities in sharing responsibility for meeting our requirements.

We will be successful when we achieve our targets towards Zero Harm, are valued by our host communities, and provide lasting social, environmental and economic benefits to society.

Scott Sullivan
President – NSW Energy Coal

25 February 2010

Appendix 3 – Blast Monitoring Results

Blast Monitoring Data

			BP04 South Muswellbrook		BP05 Antiene		BP06 Yammanie		BP07 Sheppard Avenue		BP08 Edinglassie		BP09 Denman Road West		Limits					*Limit does not apply to BP08
Date	Time	Blast area	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	5% Limit for ground vibration (mm/s)*	Limit for ground vibration (mm/s)*	5% Limit for peak overpressure (dBL)*	Limit for peak overpressure (dBL)*	BP08 Limit for ground vibration (mm/s)	BP08 Limit for peak overpressure (dBL)
7/01/11	14:01	CAn1853/BC Ptg	0.00	0.0	0.02	90.0	0.05	82.4	0.13	103.4	0.14	99.6	0.13	103.8	5	10	115	120	10	133
11/01/11	13:28	CAn1853a/BC Ptg	0.00	0.0	0.01	92.8	0.01	79.5	0.02	105.6	0.03	103.1	0.05	107.4	5	10	115	120	10	133
14/01/11	15:02	WMs2429/BL and WMs2430/UNC	0.24	91.5	0.06	75.6	0.15	75.0	0.32	95.6	1.91	103.9	3.23	98.3	5	10	115	120	10	133
14/01/11	15:05	WMs2724/VU	0.00	0.0	0.08	75.6	0.25	73.7	0.36	97.2	2.77	108.1	2.47	98.6	5	10	115	120	10	133
17/01/11	12:10	WMn2615/RL140	0.00	0.0	0.05	85.0	0.16	79.5	0.22	101.8	8.58	114.9	1.97	101.6	5	10	115	120	10	133
19/01/11	15:10	W/Shop2	0.03	103.6	0.05	89.8	0.02	74.2	0.04	98.4	0.02	95.5	0.02	97.9	5	10	115	120	10	133
20/01/11	12:40	RXn2360/ww3	0.27	106.5	0.18	89.6	0.16	86.7	0.23	106.0	0.25	100.1	1.20	102.9	5	10	115	120	10	133
25/01/11	12:45	Hun1638/R1	0.17	92.3	0.11	89.2	0.19	74.6	0.28	93.4	1.32	96.7	0.96	92.4	5	10	115	120	10	133
27/01/11	15:14	W/Shop3	0.02	85.8	0.03	95.0	0.01	75.0	0.03	91.1	0.02	81.3	0.02	92.5	5	10	115	120	10	133
28/01/11	13:16	Can1851/Eg1	0.13	114.8	0.07	89.1	0.10	85.4	0.11	112.6	0.32	111.6	0.36	107.3	5	10	115	120	10	133
31/01/11	11:35	WMs2724d/Vu	0.20	93.4	0.10	80.2	0.28	75.8	0.27	97.4	1.63	104.9	2.91	99.4	5	10	115	120	10	133
2/02/11	15:10	W/Shop 5	0.05	89.2	0.06	83.5	0.03	76.8	0.06	92.3	0.17	77.7	0.04	94.2	5	10	115	120	10	133
4/02/11	12:45	Cas1854/Eg1	0.10	86.4	0.08	87.9	0.09	71.9	0.14	88.3	0.14	90.2	0.33	89.1	5	10	115	120	10	133
9/02/11	15:16	W/Shop 6	0.02	105.2	0.06	85.6	0.02	78.3	0.03	103.1	0.03	99.7	0.02	105.9	5	10	115	120	10	133
10/02/11	12:07	WMs2624/VU	0.33	89.6	0.14	82.9	0.59	70.5	0.65	96.4	5.84	108.9	4.04	101.8	5	10	115	120	10	133
14/02/11	10:52	SN1213n/WH1	0.17	99.0	0.10	102.8	0.10	77.2	0.16	99.6	0.19	106.1	0.47	104.5	5	10	115	120	10	133
17/02/11	11:46	WMn2715/RL140	0.12	100.1	0.05	78.0	0.13	80.2	0.17	101.0	5.72*	116.3	1.16	96.1	5	10	115	120	10	133
18/02/11	15:16	W/Shop 7	0.12	104.6	0.74	104.2	0.07	72.7	0.11	101.8	0.04	98.9	0.07	92.9	5	10	115	120	10	133
23/02/11	12:05	Hun2038/BR	0.03	103.1	0.03	101.7	0.03	77.2	0.06	104.1	0.47	104.9	0.36	104.6	5	10	115	120	10	133
23/02/11	12:07	Hus2035/R	0.07	101.1	0.02	93.2	0.10	72.3	0.13	105.5	0.81	100.2	0.63	100.1	5	10	115	120	10	133
24/02/11	12:27	WMn2621Vu	0.20	92.5	0.08	85.0	0.26	74.1	0.40	95.0	6.04	111.0	1.61	99.5	5	10	115	120	10	133
25/02/11	12:48	CAs1855/Eg1	0.13	92.6	0.10	90.2	0.10	69.0	0.20	91.6	0.34	92.6	0.51	94.3	5	10	115	120	10	133
28/02/11	11:50	WMs1924/Eg1	0.31	95.1	0.08	97.2	0.29	73.4	0.56	99.3	3.37	113.3	2.08	99.0	5	10	115	120	10	133
3/03/11	10:37	Can1951/BC	0.02	91.9	0.01	101.4	0.01	71.0	0.02	86.6	0.04	91.0	0.00	0.0	5	10	115	120	10	133
4/03/11	13:05	Hus1644/R1	0.21	94.6	0.15	95.8	0.25	74.7	0.24	95.5	0.54	102.5	0.84	94.1	5	10	115	120	10	133
10/03/11	11:18	WMn2618/Vu/Bench	0.24	95.9	0.08	76.3	0.19	75.0	0.38	98.9	6.41	109.3	1.30	96.1	5	10	115	120	10	133
11/03/11	10:54	RXs1870/T	0.36	93.1	0.16	95.2	0.24	71.9	0.36	94.4	0.24	98.8	0.54	92.8	5	10	115	120	10	133
16/03/11	11:14	WMs2024/EG1	0.32	95.4	0.17	94.9	0.46	74.7	0.89	97.0	5.98	108.7	2.54	104.5	5	10	115	120	10	133
17/03/11	10:38	CAs2053/BC	0.02	91.2	0.01	86.6	0.01	71.9	0.02	94.0	0.04	103.2	0.07	100.8	5	10	115	120	10	133
21/03/11	12:13	Sns1214s/RL120	0.10	80.6	0.07	76.3	0.07	69.5	0.20	84.8	0.08	100.4	0.38	85.8	5	10	115	120	10	133
23/03/11	11:16	WMn2715s/RL140	0.08	101.7	0.04	81.0	0.07	79.9	0.13	98.2	5.29*	114.0	0.72	93.6	5	10	115	120	10	133
24/03/11	12:45	CAs2055/EG1	0.21	96.2	0.11	92.7	0.18	75.3	0.28	115.0	0.28	107.4	0.55	111.6	5	10	115	120	10	133
30/03/11	11:37	RXn1860/T	0.32	91.5	0.20	94.8	0.17	69.0	0.24	93.6	0.28	92.0	0.44	86.0	5	10	115	120	10	133

** Results provided by neighbouring mine monitoring station.*

			BP04 South Muswellbrook		BP05 Antiene		BP06 Yammanie		BP07 Sheppard Avenue		BP08 Edinglassie		BP09 Denman Road West		Limits					*Limit does not apply to BP08
Date	Time	Blast area	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	5% Limit for ground vibration (mm/s)*	Limit for ground vibration (mm/s)*	5% Limit for peak overpressure (dBL)*	Limit for peak overpressure (dBL)*	BP08 Limit for ground vibration (mm/s)	BP08 Limit for peak overpressure (dBL)
30/03/11	15:31	WMn2922/BOW	0.15	94.7	0.05	73.4	0.23	72.7	0.20	97.1	1.94	111.4	1.19	103.5	5	10	115	120	10	133
31/03/11	12:25	CAs2056/BC	0.07	99.0	0.00	93.8	0.00	73.7	0.26	107.6	0.02	101.5	0.02	102.8	5	10	115	120	10	133
5/04/11	10:38	CAs1958/BC	0.03	101.9	0.02	97.1	0.02	79.1	0.05	100.7	0.05	106.0	0.07	100.5	5	10	115	120	10	133
7/04/11	10:29	SC10/WH1	0.17	108.8	0.09	97.4	0.13	73.7	0.19	97.2	0.13	94.3	0.30	95.7	5	10	115	120	10	133
12/04/11	11:35	CAc2052/Eg1	0.31	100.4	0.13	101.2	0.23	77.0	0.20	96.7	0.56	102.1	0.65	110.4	5	10	115	120	10	133
19/04/11	12:16	WMs2924/BOW	0.18	95.2	0.07	75.0	0.23	101.4	0.34	96.3	1.62	112.5	1.98	101.7	5	10	115	120	10	133
19/04/11	13:21	SN1214n/WH1	0.14	92.1	0.07	81.0	0.10	91.4	0.15	71.2	0.10	81.3	0.32	77.6	5	10	115	120	10	133
21/04/11	10:59	RXc1865/T	0.26	92.2	0.19	97.3	0.19	106.8	0.62	96.7	0.20	90.2	0.58	86.4	5	10	115	120	10	133
2/05/11	12:31	Hun2035/BR	0.08	97.1	0.04	90.8	0.14	112.1	0.15	100.4	1.11	111.2	0.63	100.9	5	10	115	120	10	133
2/05/11	12:34	WMn2230/CT	0.14	90.1	0.05	81.3	0.17	100.2	0.24	94.5	0.75	105.1	1.39	101.5	5	10	115	120	10	133
3/05/11	11:51	WMn2619/Vu	0.22	96.8	0.07	77.5	0.21	99.6	0.39	98.5	5.44	108.1	1.91	97.7	5	10	115	120	10	133
3/05/11	12:54	WMn2619/Vu (misfire)	0.08	91.8	0.04	84.3	0.08	98.1	0.18	94.8	3.02	106.1	0.79	97.2	5	10	115	120	10	133
4/05/11	11:08	RXc2368/WW3	0.08	101.3	0.06	99.3	0.05	107.4	0.07	100.7	0.08	102.8	0.00	0.0	5	10	115	120	10	133
4/05/11	11:10	RXs2373/WW3	0.09	100.6	0.07	103.4	0.05	110.5	0.12	101.1	0.05	98.8	0.00	0.0	5	10	115	120	10	133
11/05/11	11:33	WMn2815/RL145	0.07	107.1	0.04	80.6	0.06	109.6	0.17	114.0	5.40	111.0	0.76	111.6	5	10	115	120	10	133
11/05/11	14:16	CAs21/BC	0.02	104.2	0.01	85.6	0.02	112.4	0.05	111.0	0.05	96.9	0.07	107.6	5	10	115	120	10	133
12/05/11	11:34	WMs2927/BOW	0.18	99.2	0.08	89.1	0.25	109.3	0.25	108.6	1.32	111.1	4.39	107.3	5	10	115	120	10	133
16/05/11	12:16	WMn2224/ct	0.08	92.1	0.07	75.0	0.09	99.0	0.16	93.6	3.08	109.2	0.92	92.7	5	10	115	120	10	133
16/05/11	12:19	WMn2615/VU	0.10	88.0	0.05	79.4	0.21	100.9	0.21	90.4	0.77	102.7	1.74	91.8	5	10	115	120	10	133
18/05/11	01:17	CAs1958/Eg1	0.14	92.8	0.09	91.6	0.11	105.4	0.19	91.2	0.15	98.0	0.39	98.3	5	10	115	120	10	133
19/05/11	01:15	Wmn2115/ct	0.20	94.7	0.07	78.9	0.21	100.8	0.34	98.6	3.64	113.1	1.16	102.3	5	10	115	120	10	133
20/05/11	11:01	HUn2035/MUU	0.11	92.7	0.07	101.4	0.14	101.6	0.23	98.2	1.25	108.6	2.99	107.9	5	10	115	120	10	133
23/05/11	14:32	WMn2121/CT	0.19	102.8	0.12	100.3	0.29	107.9	0.66	106.0	2.19	105.8	1.99	112.1	5	10	115	120	10	133
25/05/11	11:09	SN1214/WH1	0.08	96.8	0.07	88.0	0.05	107.2	0.08	84.0	0.08	108.5	0.35	100.6	5	10	115	120	10	133
27/05/11	12:37	HUn2035/BR	0.05	94.9	0.02	88.5	0.07	101.8	0.12	94.8	0.44	97.9	0.50	99.9	5	10	115	120	10	133
6/06/11	10:44	CAs2157/BC	0.01	88.2	0.01	92.4	0.01	103.8	0.03	104.3	0.03	97.7	0.04	94.1	5	10	115	120	10	133
7/06/11	10:55	AYs01/RL240	0.05	97.6	0.02	100.5	0.03	95.8	0.05	88.3	0.03	84.3	0.00	0.0	5	10	115	120	10	133
9/06/11	11:19	HUs1940/BR	0.09	99.7	0.04	98.3	0.07	111.9	0.10	105.0	0.31	97.3	0.90	109.5	5	10	115	120	10	133
10/06/11	11:33	WMs3024/MUU	0.19	95.2	0.08	76.9	0.32	101.8	0.30	98.9	1.83	118.0	3.12	100.2	5	10	115	120	10	133
22/06/11	13:55	HUn2730/MUU	0.35	101.5	0.18	83.5	0.47	108.0	0.67	104.9	2.61	114.0	^	^	5	10	115	120	10	133
28/06/11	13:50	CAs1856/T	0.15	105.1	0.45	101.4	0.13	111.3	0.23	97.9	0.28	105.3	0.11	95.9	5	10	115	120	10	133
28/06/11	13:51	RXs1970/BA	0.10	106.7	0.07	88.2	0.06	115.9	0.14	105.4	0.05	103.5	0.23	106.2	5	10	115	120	10	133
4/07/11	10:56	WMs2328/CT	0.12	112.4	0.04	97.1	0.20	102.1	0.22	91.5	0.87	101.4	1.35	100.5	5	10	115	120	10	133

^ *No data available due to equipment failure.*

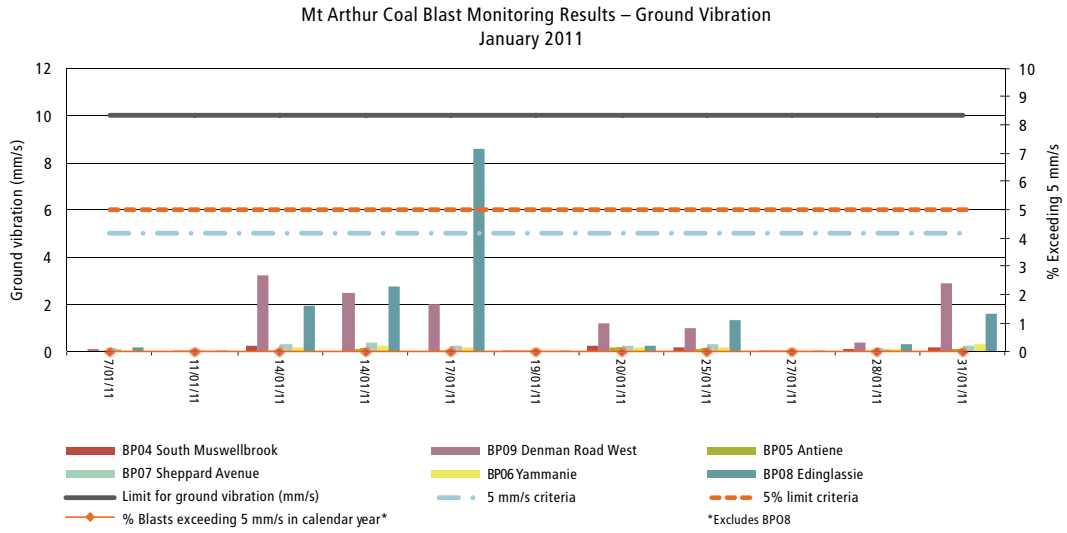
			BP04 South Muswellbrook		BP05 Antiene		BP06 Yammanie		BP07 Sheppard Avenue		BP08 Edinglassie		BP09 Denman Road West		Limits					
																				*Limit does not apply to BP08
Date	**Time**	**Blast area**	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	5% Limit for ground vibration (mm/s)*	Limit for ground vibration (mm/s)*	5% Limit for peak overpressure (dBL)*	Limit for peak overpressure (dBL)*	BP08 Limit for ground vibration (mm/s)	BP08 Limit for peak overpressure (dBL)
6/07/11	11:21	WMn2717/VU	0.14	112.5	0.06	102.4	0.14	114.4	0.32	119.6	6.37	112.6	1.07	114.0	5	10	115	120	10	133
7/07/11	10:51	CAn2049/T	0.00	0.0	0.02	107.3	0.04	113.9	0.09	120.0	0.12	107.4	0.14	105.8	5	10	115	120	10	133
13/07/11	11:16	CAs2155/EG1	0.25	99.3	0.16	106.7	0.32	107.4	0.36	98.5	0.69	107.2	1.21	95.2	5	10	115	120	10	133
18/07/11	13:59	HUn2636/MUU	0.17	97.4	0.12	99.2	0.24	107.6	0.39	109.5	1.84	108.1	3.57	97.5	5	10	115	120	10	133
18/07/11	14:01	HUn1939/BL & HUs2040/BR	0.13	103.0	0.07	91.1	0.09	103.4	0.15	109.0	0.89	96.9	0.70	93.3	5	10	115	120	10	133
21/07/11	12:01	RXn2166/CT	0.10	96.0	0.08	91.8	0.06	100.1	0.13	105.5	0.11	102.5	0.26	99.8	5	10	115	120	10	133
25/07/11	11:36	WMn2320/WU	0.25	89.9	0.17	93.2	0.22	97.2	0.42	93.4	5.35	115.7	1.39	96.5	5	10	115	120	10	133
26/07/11	10:49	HUn2636/MUU East	0.15	101.3	0.08	95.6	0.15	101.7	0.20	103.2	1.40	106.7	1.58	101.8	5	10	115	120	10	133
27/07/11	12:19	AYs01/EG1 RL215	0.08	88.4	0.04	90.2	0.04	94.5	0.08	83.6	0.03	86.9	0.07	82.2	5	10	115	120	10	133
29/07/11	10:53	CAs1960/EG1	0.23	100.9	0.15	105.2	0.12	112.4	0.19	96.1	0.17	103.2	0.36	93.2	5	10	115	120	10	133
29/07/11	11:50	WMs2127/T	0.03	94.3	0.03	90.0	0.08	101.4	0.10	93.3	0.32	100.1	0.29	87.0	5	10	115	120	10	133
1/08/11	11:12	CAc1851/T	0.10	87.5	0.05	91.8	0.09	104.0	0.08	88.6	0.25	94.8	0.20	92.2	5	10	115	120	10	133
2/08/11	12:00	Hun2637/MUU	0.27	98.1	0.12	102.1	0.20	97.1	0.37	93.1	1.37	104.9	2.03	101.0	5	10	115	120	10	133
2/08/11	12:04	WMn2424/BL	0.11	94.3	0.03	99.9	0.12	100.2	0.14	98.0	1.35	106.8	1.57	93.8	5	10	115	120	10	133
5/08/11	11:06	WMn2817/VU	0.08	98.5	0.06	93.5	0.09	101.8	0.17	98.2	7.07	113.0	0.89	104.9	5	10	115	120	10	133
8/08/11	11:02	HUs2639/MUU	0.28	101.6	0.16	97.1	0.21	106.5	0.33	101.3	1.28	103.6	4.59	101.8	5	10	115	120	10	133
10/08/11	11:14	WMn2420/WU	0.22	102.6	0.10	96.2	0.25	107.9	0.69	115.0	2.89	111.7	0.72	102.5	5	10	115	120	10	133
11/08/11	11:00	WMs2127/T North & WMs2330/BA	0.17	95.5	0.09	93.6	0.28	100.7	0.29	93.0	1.14	102.7	3.06	95.3	5	10	115	120	10	133
16/08/11	12:11	SC11/WH1 South	0.17	84.2	0.13	90.3	0.23	92.3	0.23	84.7	0.14	90.7	0.31	85.9	5	10	115	120	10	133
17/08/11	11:28	HUn1744/BL	0.09	88.7	0.05	89.6	0.07	100.7	0.09	93.9	0.55	112.8	0.66	103.5	5	10	115	120	10	133
19/08/11	11:02	WMn2121/BA North	0.23	103.8	0.10	97.8	0.23	108.2	0.26	102.5	3.81	109.8	1.06	91.7	5	10	115	120	10	133
24/08/11	12:24	AYn02/RL240 North	0.02	78.7	0.00	76.9	0.01	80.4	0.01	84.5	0.01	81.5	0.03	92.3	5	10	115	120	10	133
26/08/11	10:09	RXn1865/R5 Ptg	0.01	94.7	0.02	93.1	0.01	99.5	0.01	93.9	0.01	94.5	0.03	83.2	5	10	115	120	10	133
29/08/11	11:17	HUs1844/BL	0.20	86.3	0.06	87.0	0.10	96.9	0.12	88.5	0.38	96.7	0.53	89.3	5	10	115	120	10	133
31/08/11	10:32	SN13s/WH1	0.01	83.9	0.01	85.4	0.01	94.7	0.01	86.0	0.01	89.5	0.03	81.7	5	10	115	120	10	133
2/09/11	10:08	SS06/GM1	0.03	102.8	0.03	93.5	0.02	107.0	0.04	98.9	0.03	101.2	0.05	101.4	5	10	115	120	10	133
5/09/11	11:26	WMs2929/MUU	0.26	91.5	0.13	78.9	0.33	105.0	0.32	95.1	1.86	111.2	4.15	105.8	5	10	115	120	10	133
8/09/11	11:10	WMn2121/BA Sth	0.13	89.1	0.07	83.2	0.15	108.7	0.28	98.1	1.54	109.7	0.93	96.7	5	10	115	120	10	133
15/09/11	15:35	WMs2230/BA	0.10	102.2	0.04	83.5	0.17	107.2	0.16	107.1	0.74	102.1	0.96	103.8	5	10	115	120	10	133
15/09/11	15:49	WMs2627/BL	0.20	99.0	0.11	91.1	0.37	107.5	0.47	112.1	2.55	109.6	4.84	102.9	5	10	115	120	10	133
22/09/11	11:55	SC11/WH1 (north half)	0.09	91.8	0.06	86.0	0.09	96.8	0.12	88.9	0.10	84.0	0.21	81.1	5	10	115	120	10	133
23/09/11	10:32	HUn2036/BL	0.06	84.0	0.04	78.5	0.11	92.8	0.12	86.6	0.71	95.0	0.78	87.8	5	10	115	120	10	133

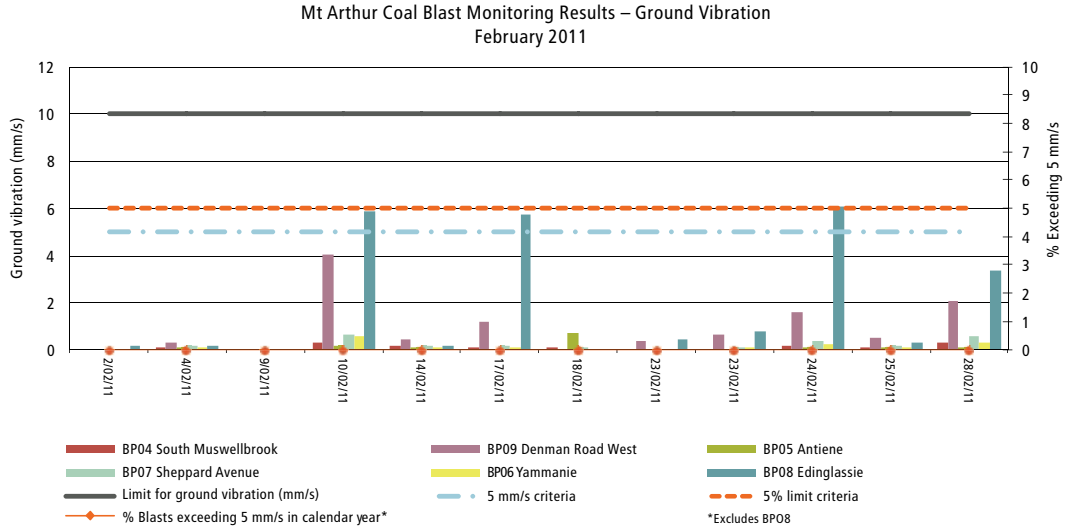
Appendix 3 – Blast Monitoring Results continued

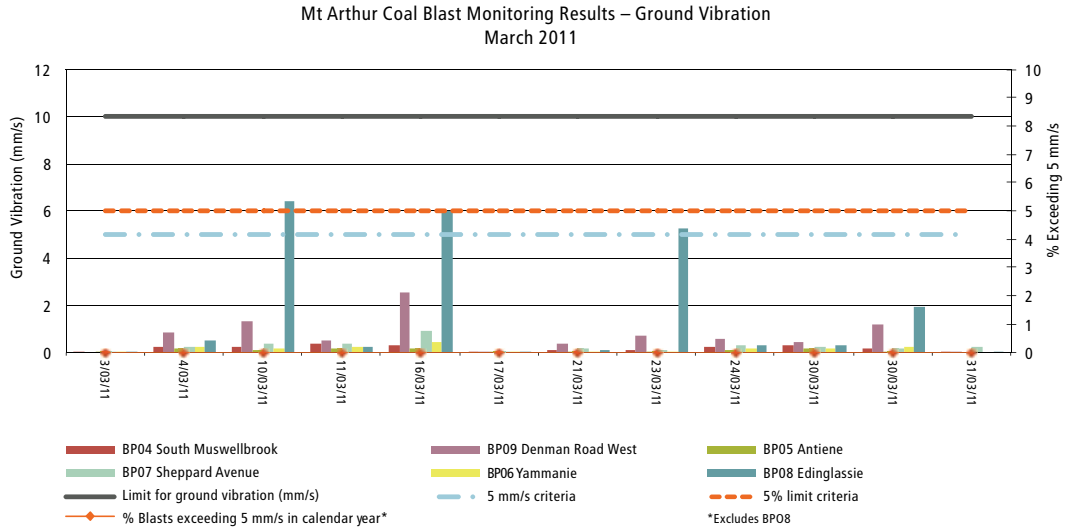
*Limit does not apply to BP08

			BP04 South Muswellbrook		BP05 Antiene		BP06 Yammanie		BP07 Sheppard Avenue		BP08 Edinglassie		BP09 Denman Road West		Limits					
Date	Time	Blast area	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	Ground vibration (mm/s)	Blast overpressure (dBL)	5% Limit for ground vibration (mm/s)*	Limit for ground vibration (mm/s)*	5% Limit for peak overpressure (dBL)*	Limit for peak overpressure (dBL)*	BP08 Limit for ground vibration (mm/s)	BP08 Limit for peak overpressure (dBL)
26/09/11	11:07	RXn1860/T	0.54	111.4	0.22	93.9	0.24	107.8	0.50	107.6	0.44	110.8	1.17	107.5	5	10	115	120	10	133
28/09/11	13:16	RXs2273/MU	0.19	89.9	0.08	102.0	0.10	95.4	0.16	86.6	0.06	90.9	0.29	94.4	5	10	115	120	10	133
5/10/11	12:02	Hun2326-UNC	0.28	93.3	0.12	79.8	0.18	102.3	0.34	99.7	2.09	109.6	4.15	109.3	5	10	115	120	10	133
6/10/11	10:37	CAc1951/T	0.11	88.8	0.07	88.2	0.08	94.3	0.09	88.2	0.15	94.9	0.27	91.1	5	10	115	120	10	133
11/10/11	10:37	HUs1944/BL	0.09	94.5	0.06	96.2	0.07	102.1	0.08	91.6	0.51	95.9	0.51	90.0	5	10	115	120	10	133
13/10/11	12:26	SS07/GM1 East	0.01	102.1	0.01	111.9	0.01	105.6	0.02	107.0	0.01	99.0	0.01	93.9	5	10	115	120	10	133
14/10/11	13:19	Hun2326/UNC east	0.14	107.0	0.09	78.5	0.14	113.5	0.29	100.2	1.23	115.1	1.53	109.3	5	10	115	120	10	133
18/10/11	10:35	SC10/WH1	0.03	95.2	0.02	82.0	0.01	101.9	0.03	87.2	0.02	93.5	0.03	86.9	5	10	115	120	10	133
18/10/11	10:37	SS07/GM1	0.09	97.6	0.05	82.6	0.06	101.2	0.15	86.7	0.10	96.3	0.15	93.1	5	10	115	120	10	133
20/10/11	11:07	WMn2622/BL	0.18	94.4	0.08	86.2	0.27	103.2	0.50	95.4	4.10	110.6	2.95	96.3	5	10	115	120	10	133
24/10/11	11:53	HUn2340/UNC	0.53	96.5	0.29	95.7	0.28	107.1	0.41	96.9	1.49	105.6	2.50	98.0	5	10	115	120	10	133
31/10/11	12:22	RXn2266/MU	0.05	104.2	0.03	94.3	0.02	104.7	0.03	103.7	0.04	94.4	0.10	98.9	5	10	115	120	10	133
2/11/11	11:18	CAs1958/T	0.19	95.2	0.13	98.3	0.17	102.0	0.28	96.1	0.30	97.2	0.51	89.1	5	10	115	120	10	133
2/11/11	12:26	WMn2818/RL130	0.18	93.4	0.11	76.9	0.34	100.2	0.48	94.3	5.04	117.6	1.53	96.3	5	10	115	120	10	133
4/11/11	10:50	RXs25/Endwall	0.15	97.6	0.12	103.5	0.13	102.2	0.28	97.5	0.07	100.0	0.20	91.7	5	10	115	120	10	133
8/11/11	10:32	MCe2005/BC	0.06	91.0	0.01	88.9	0.08	103.2	0.09	91.2	0.29	100.8	0.04	86.4	5	10	115	120	10	133
9/11/11	11:58	WMs2027/R1	0.30	93.2	0.12	88.6	0.30	101.9	0.42	91.8	2.35	99.9	1.69	88.9	5	10	115	120	10	133
15/11/11	10:21	AYs01ERL216	0.03	98.1	0.01	84.3	0.02	109.7	0.02	94.5	0.02	93.3	0.04	98.9	5	10	115	120	10	133
16/11/11	12:00	CAn2449/BOW	0.24	89.3	0.12	93.7	0.19	97.9	0.29	85.6	0.51	103.6	1.80	102.0	5	10	115	120	10	133
22/11/11	11:48	MCe2005/BC	0.08	99.0	0.02	97.9	0.08	111.1	0.12	98.1	0.24	102.6	0.05	84.3	5	10	115	120	10	133
22/11/11	11:50	WMs2529/VU	0.15	94.1	0.07	93.0	0.17	101.7	0.28	98.9	1.12	106.0	3.01	101.1	5	10	115	120	10	133
28/11/11	12:04	WMs2329/BA	0.07	94.5	0.04	79.8	0.12	96.7	0.19	95.8	0.61	101.5	0.95	92.1	5	10	115	120	10	133
29/11/11	12:08	RXs2373/MU	0.21	90.4	0.11	96.5	0.12	99.4	0.21	92.1	0.13	93.2	0.47	90.7	5	10	115	120	10	133
6/12/11	12:39	CAs2058/T	0.28	95.8	0.20	95.2	0.20	113.9	0.35	108.3	0.52	106.8	0.86	110.1	5	10	115	120	10	133
19/12/11	12:39	CAs2157/T	0.26	101.0	0.12	98.6	0.24	105.9	0.39	104.6	0.43	96.1	0.59	99.1	5	10	115	120	10	133
19/12/11	12:47	HUn2039/BL	0.04	98.2	0.03	86.8	0.04	98.5	0.08	101.1	0.48	88.4	0.54	95.3	5	10	115	120	10	133
20/12/11	11:57	CAn2252/BOW	0.13	101.2	0.07	94.0	0.11	102.6	0.15	98.7	0.61	102.9	0.79	99.0	5	10	115	120	10	133
21/12/11	10:04	SS08/GM1	0.09	96.0	0.04	81.7	0.04	101.3	0.09	98.1	0.05	99.6	0.08	99.3	5	10	115	120	10	133
23/12/11	11:01	CAc2052/T & CAn1853/R1	0.10	91.5	0.08	85.4	0.10	97.1	0.11	92.5	0.33	97.6	0.32	94.1	5	10	115	120	10	133

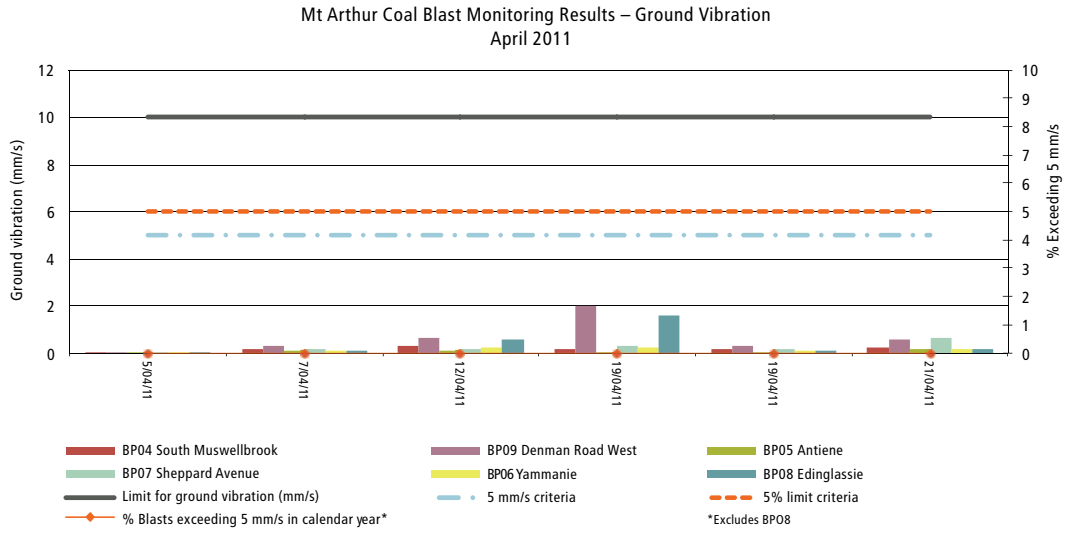
Blast Monitoring Graphs

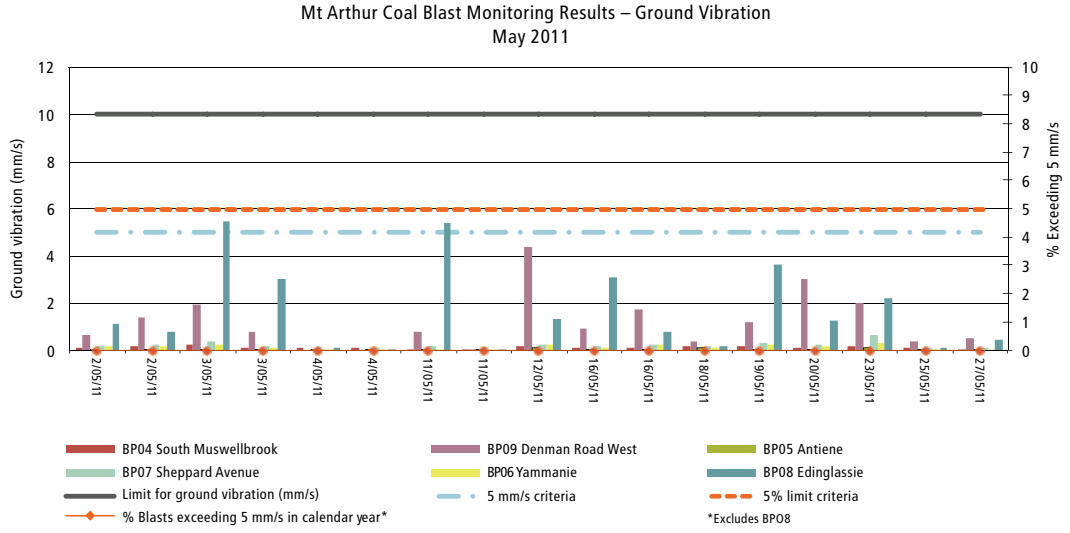


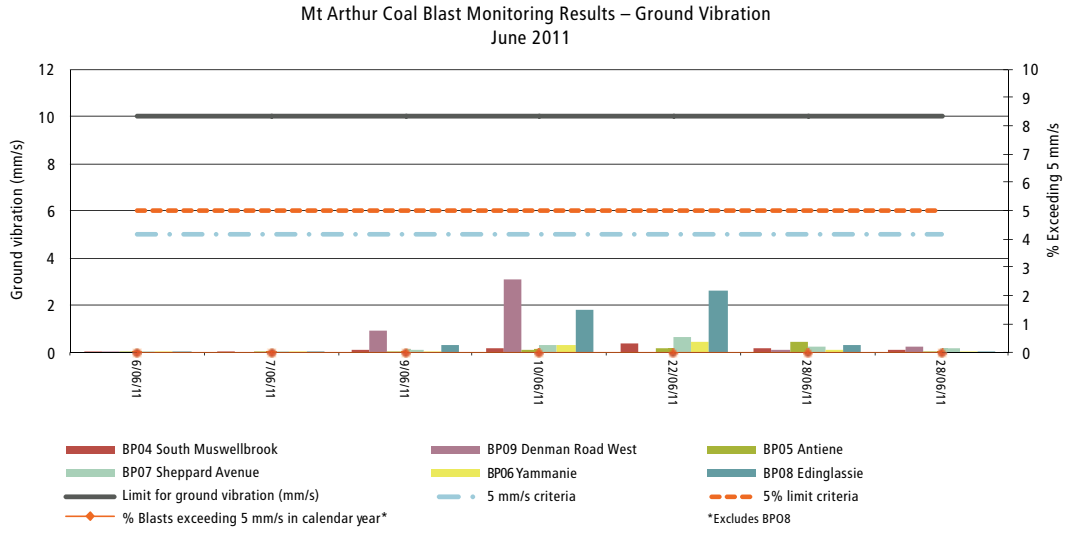




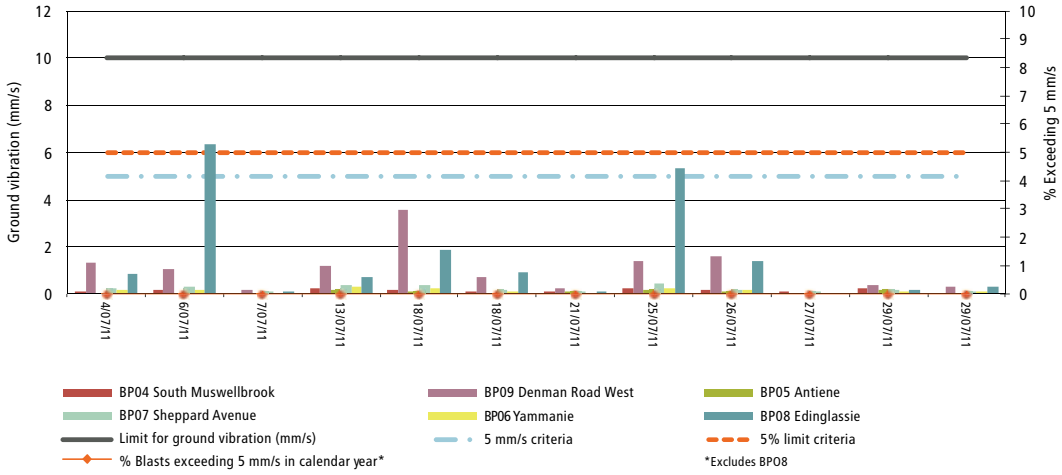
Appendix 3 – Blast Monitoring Results continued



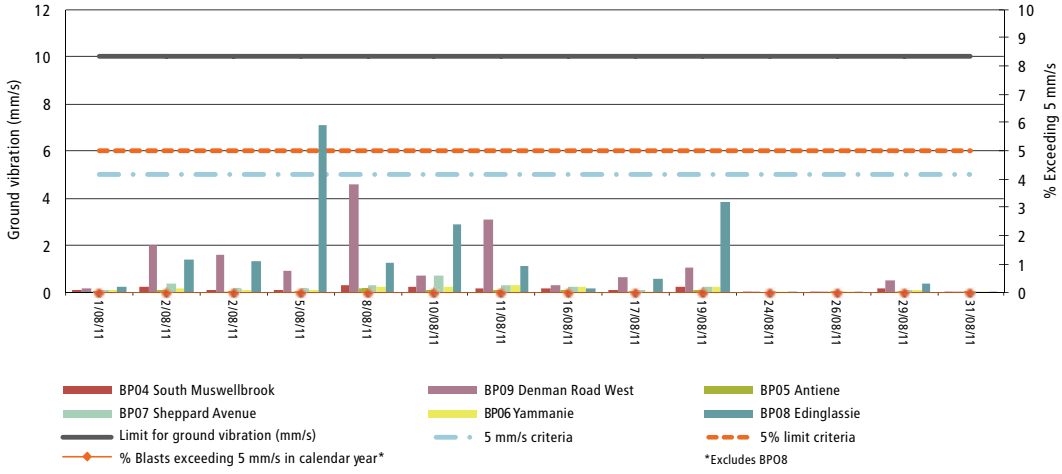




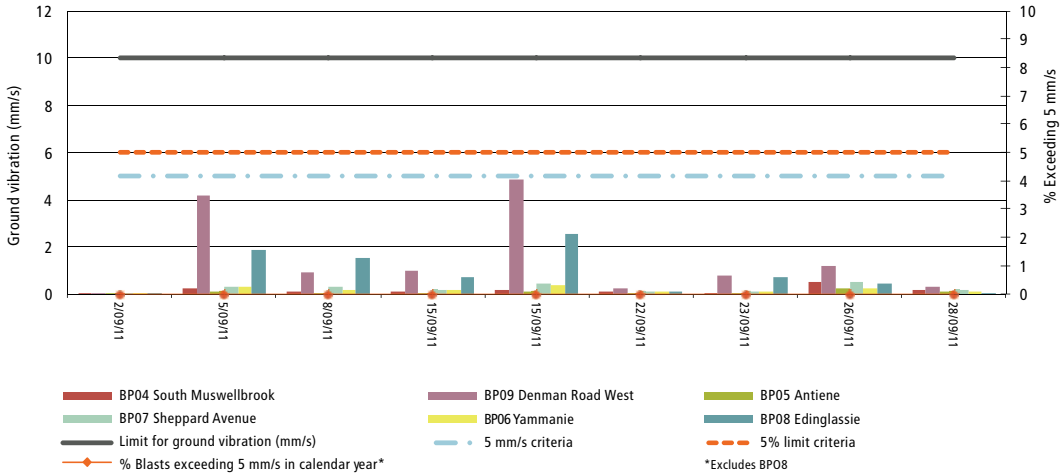
Mt Arthur Coal Blast Monitoring Results – Ground Vibration
July 2011



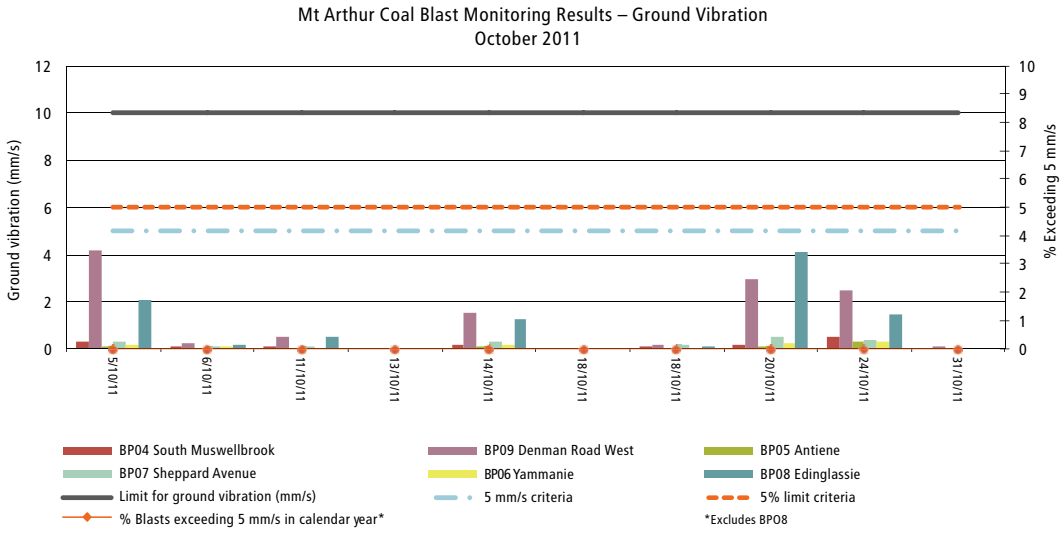
Mt Arthur Coal Blast Monitoring Results – Ground Vibration
August 2011

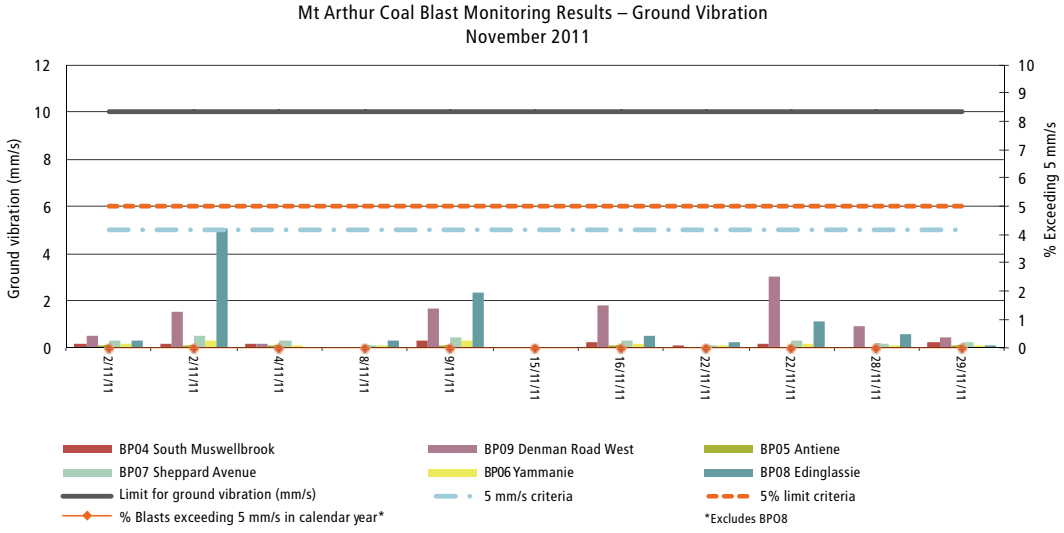


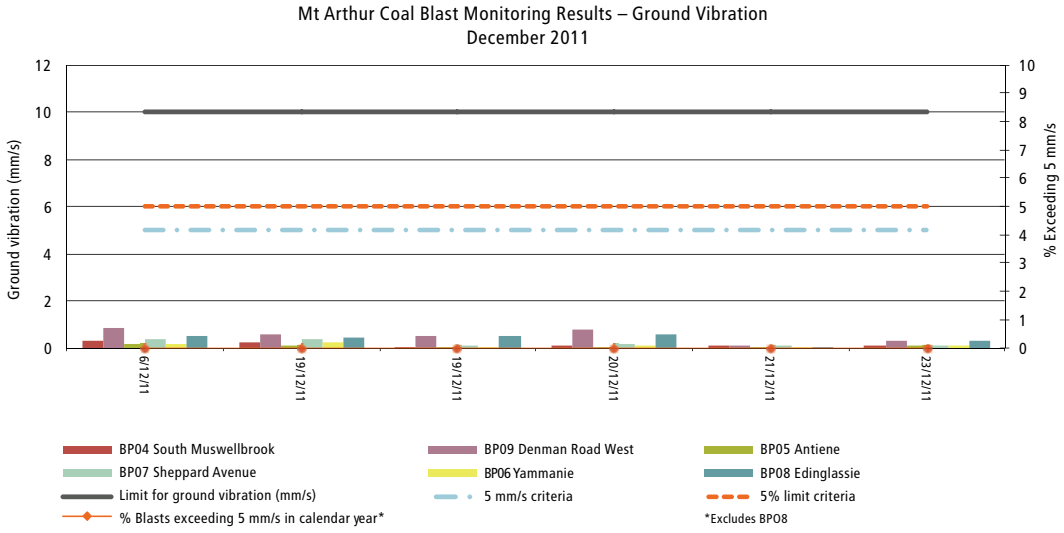
Mt Arthur Coal Blast Monitoring Results – Ground Vibration
September 2011



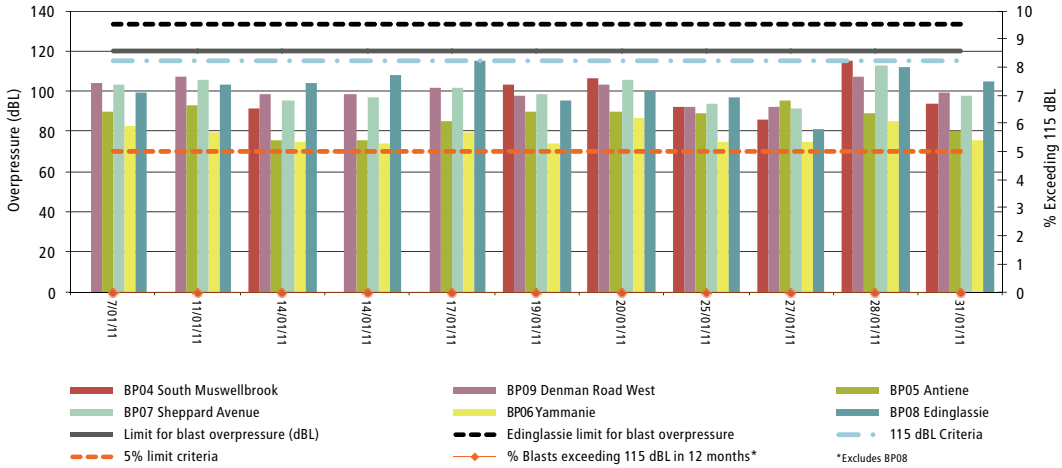
Appendix 3 – Blast Monitoring Results continued



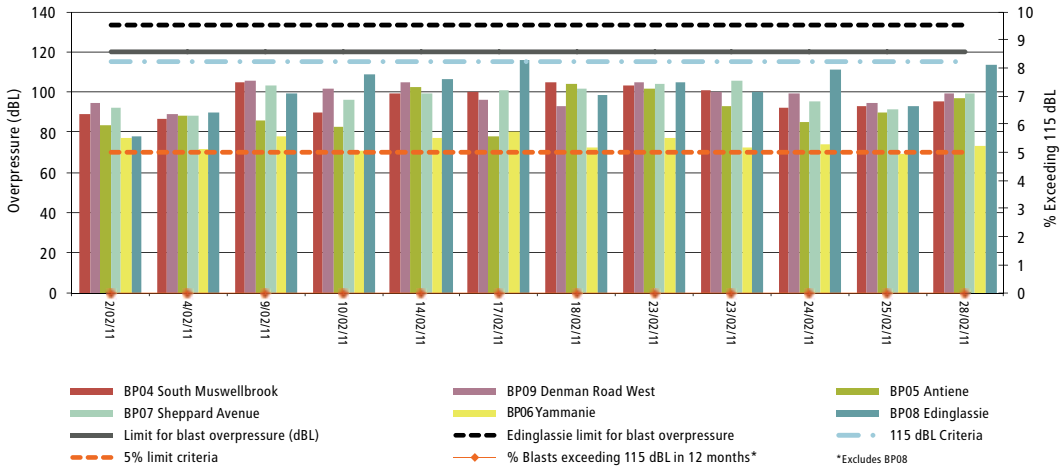




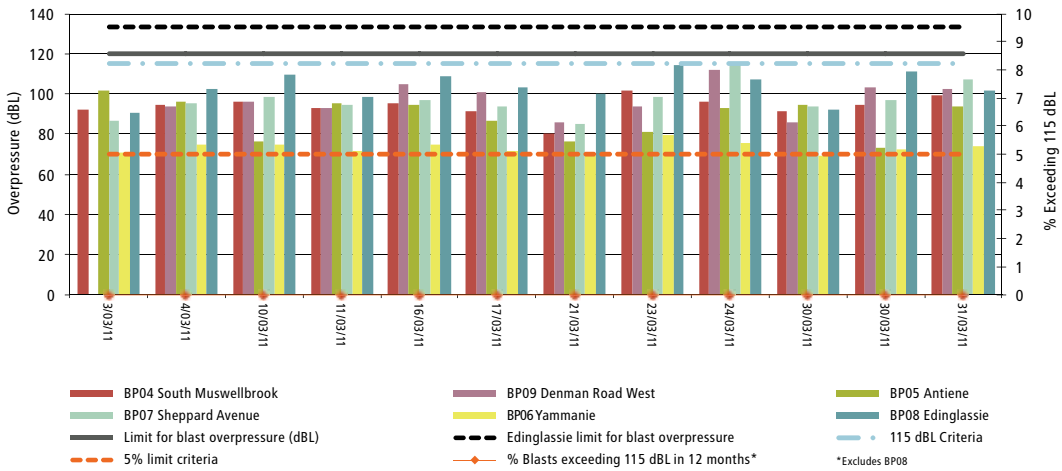
Mt Arthur Coal Blast Monitoring Results – Overpressure
January 2011



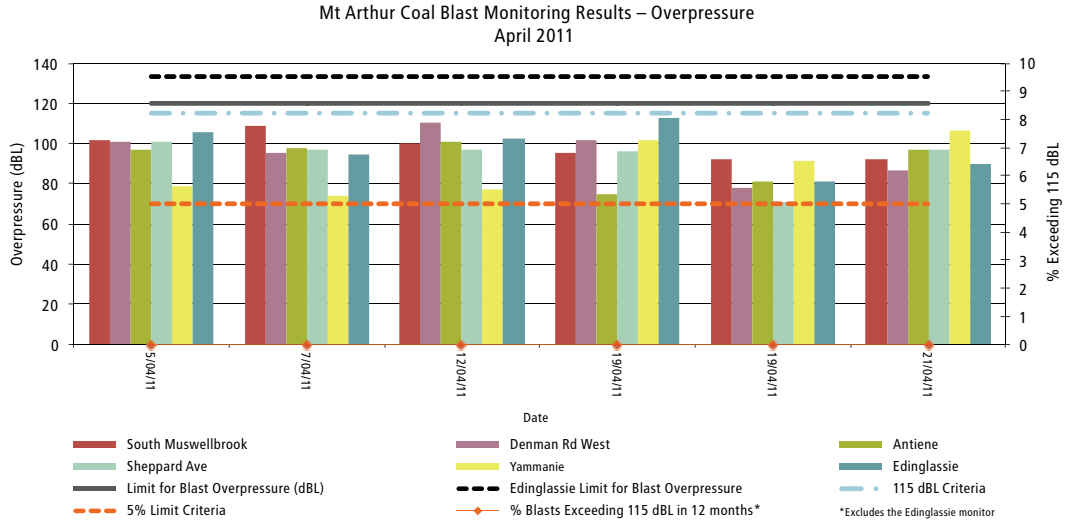
Mt Arthur Coal Blast Monitoring Results – Overpressure
February 2011

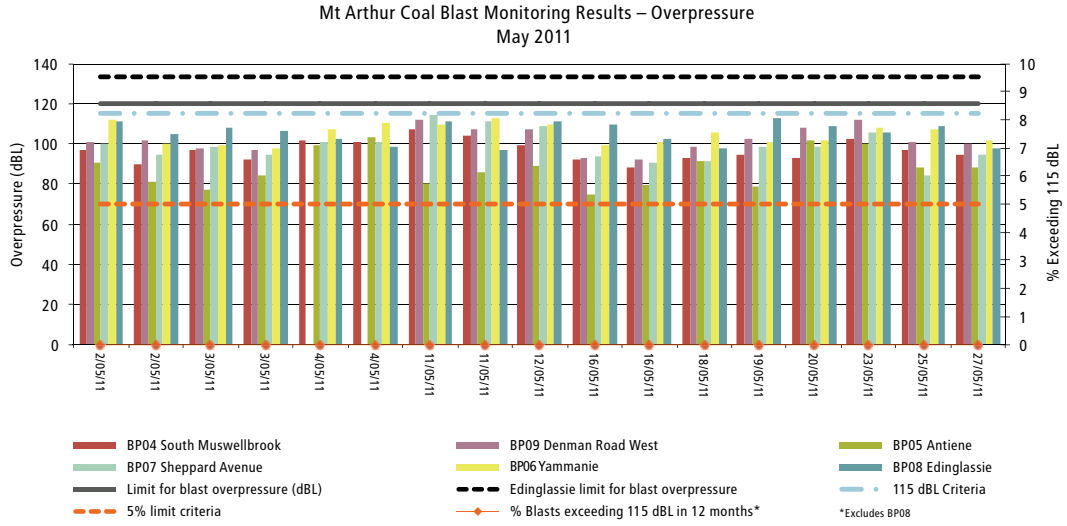


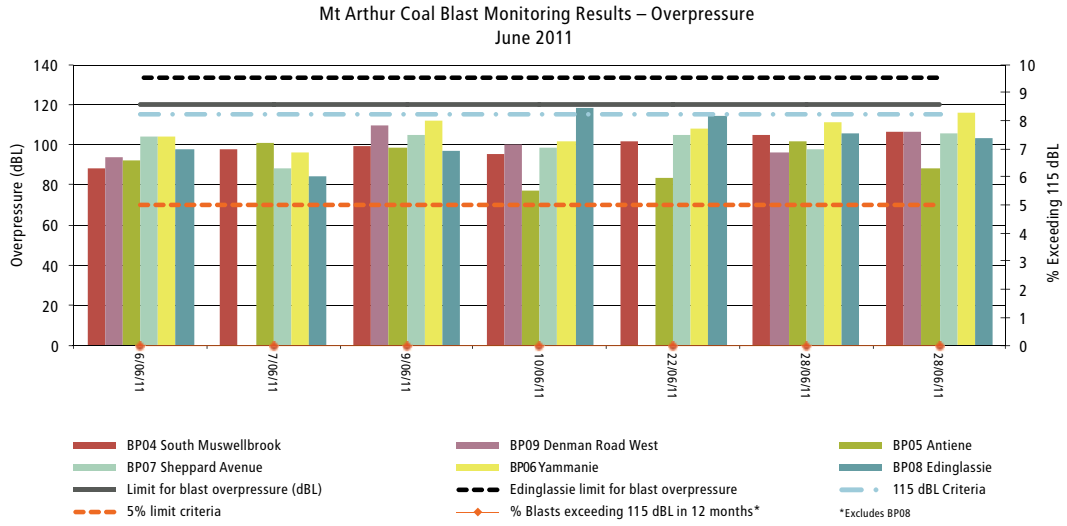
Mt Arthur Coal Blast Monitoring Results – Overpressure
March 2011



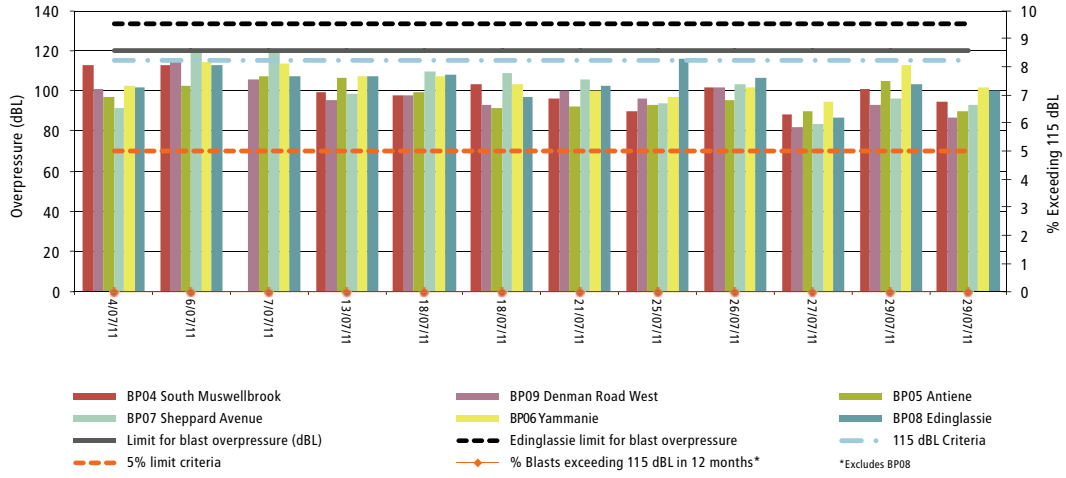
Appendix 3 – Blast Monitoring Results continued



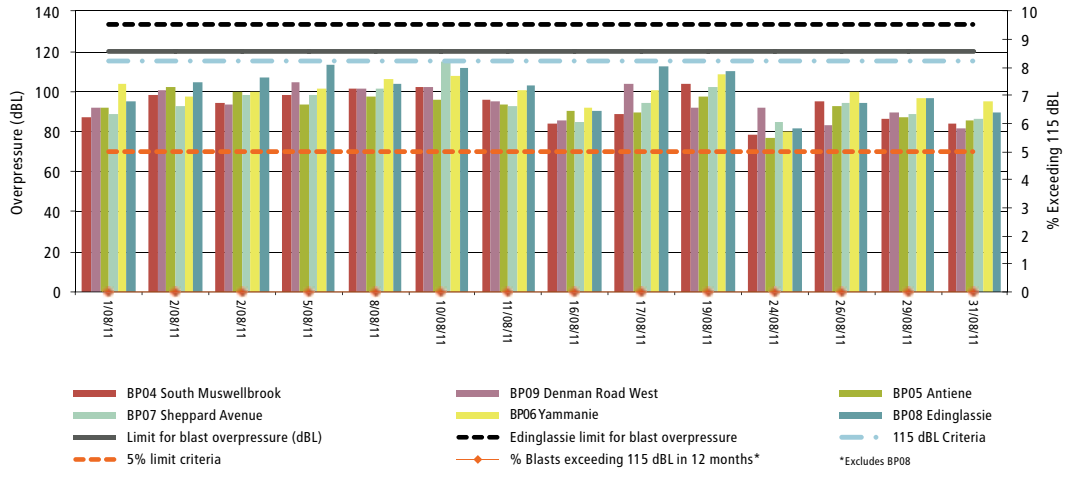




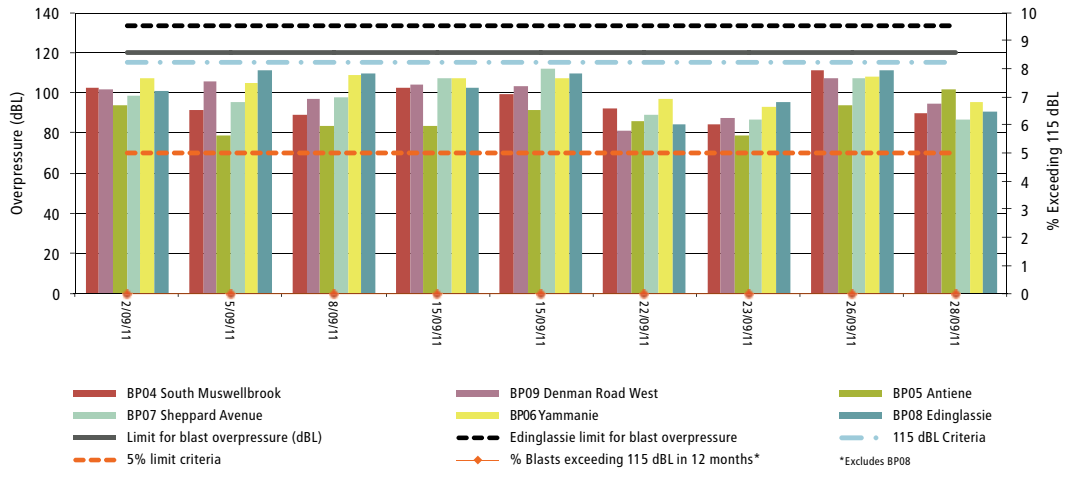
Mt Arthur Coal Blast Monitoring Results – Overpressure
July 2011



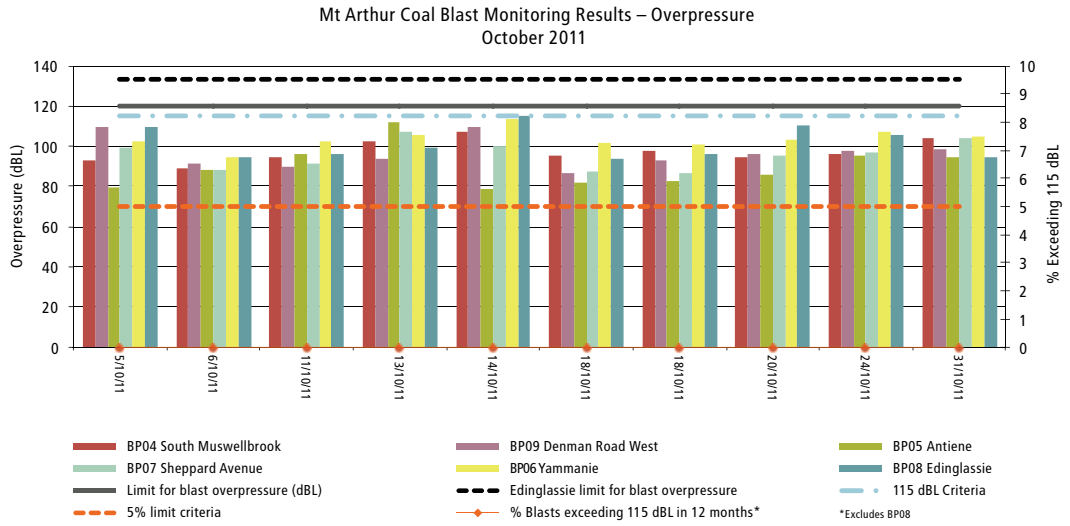
Mt Arthur Coal Blast Monitoring Results – Overpressure
August 2011

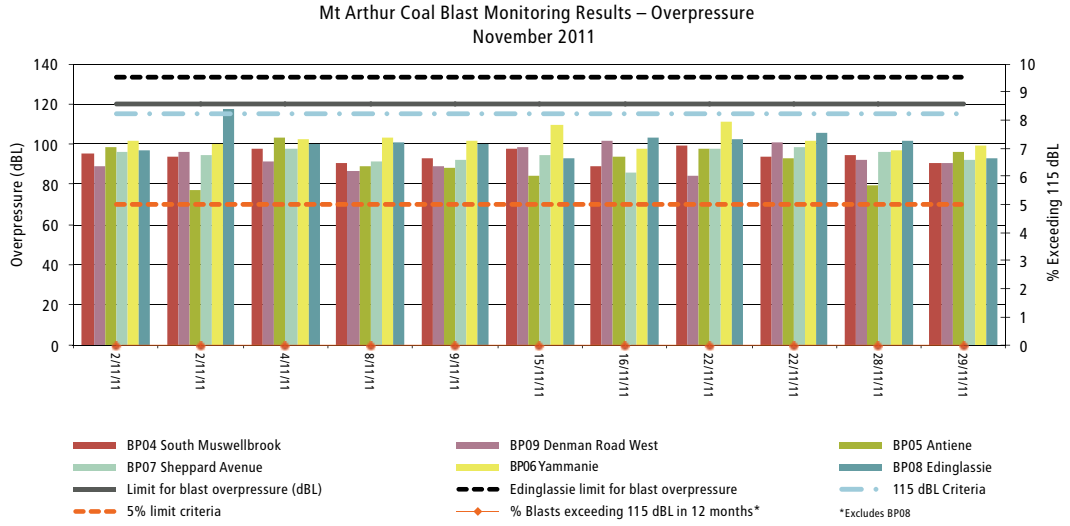


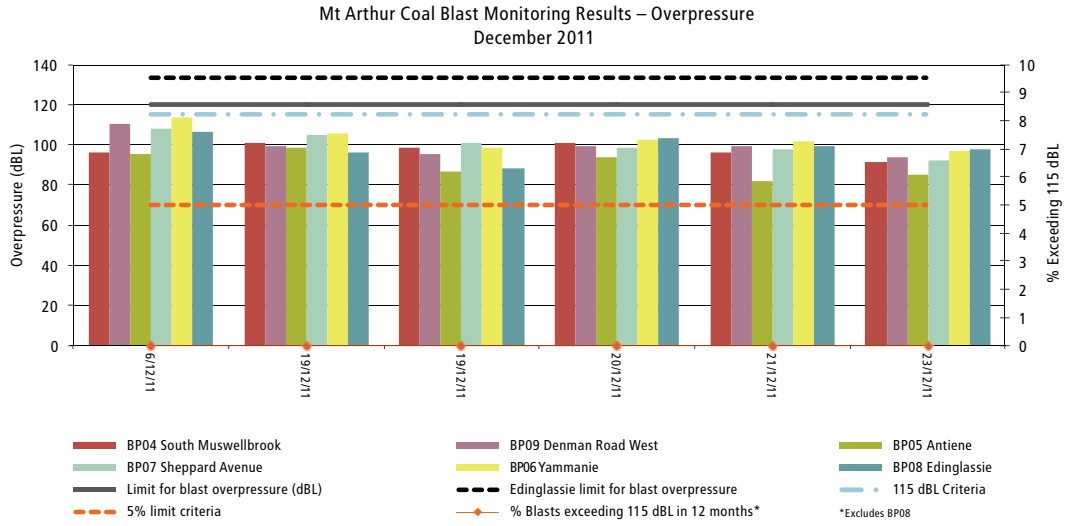
Mt Arthur Coal Blast Monitoring Results – Overpressure
September 2011



Appendix 3 – Blast Monitoring Results continued







Appendix 4 – Air Quality Monitoring Results

Depositional Dust Monitoring Data

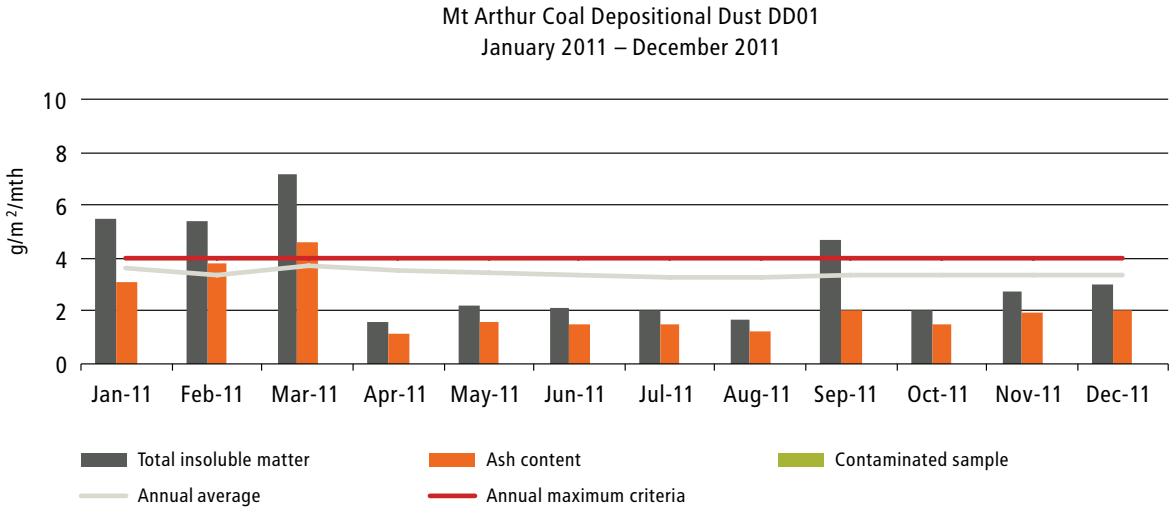
	DD01		DD02		DD03		DD04		DD05		DD06		DD07	
	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)
January	5.5	3.1	6.5	4.1	6.4	4.6	3.0	2.1	2.0	1.3	*	1.7	**	
February	5.4	3.8	*	4.1	*	7.6	2.7	1.1	4.2	2.6	*	1.8	1.4	0.9
March	7.2	4.6	*	4.9	0.5	0.2	3.1	2.1	3.7	2.4	2.4	1.5	0.9	0.6
April	1.6	1.1	1.7	1.1	2.9	1.5	1.8	1.4	*	0.7	2.6	1.6	0.7	0.4
May	2.2	1.6	4.8	3.0	3.6	1.9	1.6	1.1	*	0.7	0.9	0.6	0.6	0.4
June	2.1	1.5	4.2	3.0	5.9	3.6	1.0	0.7	*	2.8	1.6	1.1	2.4	1.0
July	2.0	1.5	3.3	2.4	3.3	2.0	1.0	0.8	*	1.7	1.8	1.0	0.4	0.3
August	1.7	1.2	2.6	1.8	2.3	1.5	2.0	0.9	*	5.2	1.8	1.2	0.9	0.6
September	4.7	2.0	2.7	2.0	2.0	1.3	1.1	0.8	2.5	1.6	1.3	0.7	1.3	0.9
October	2.0	1.5	2.3	1.7	**		1.5	1.1	*	5.8	1.0	0.7	1.4	1.0
November	2.7	1.9	8.2	5.1	4.1	2.7	2.2	1.6	3.9	2.9	2.9	1.7	1.9	1.2
December	3.0	2.0	*	6.3	**		2.5	1.6	3.2	1.8	1.5	1.0	1.0	0.6
Annual average	**3.3**		**4.0**		**3.4**		**2.0**		**3.3**		**1.8**		**1.2**	
Annual criteria	**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**	

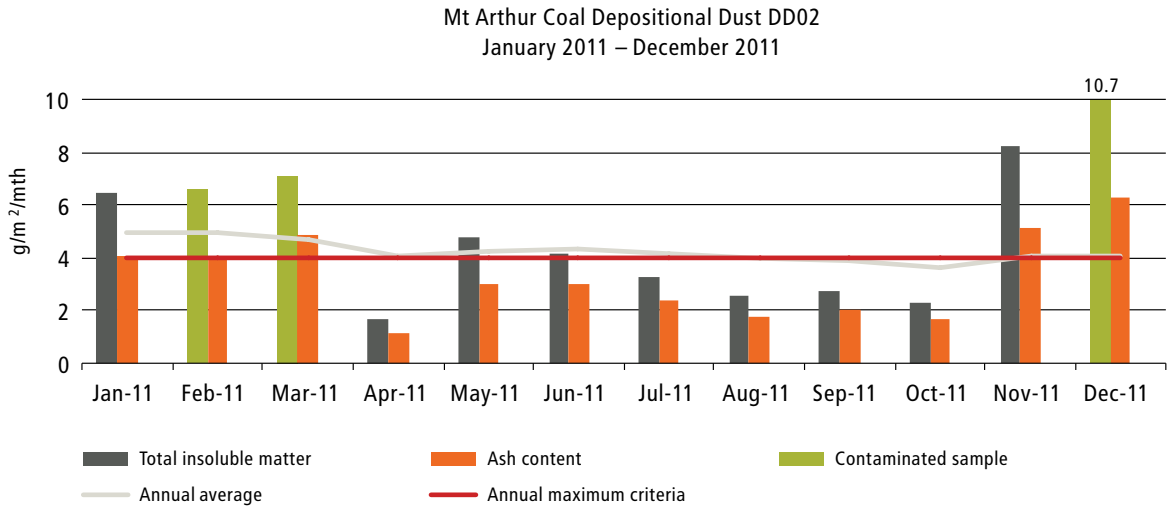
	DD08		DD09		DD10		DD11		DD12		DD13		DD14	
	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)
January	1.5	0.9	1.5	0.9	2.7	1.9	1.8	1.3	4.0	2.3	1.8	1.3	1.6	0.9
February	*	2.4	1.9	1.3	3.7	2.8	2.1	1.6	2.3	1.5	4.2	1.9	1.8	1.4
March	2.7	1.9	2.3	1.6	3.1	2.2	2.7	2.0	2.1	1.1	5.4	3.3	2.2	1.6
April	0.8	0.5	0.8	0.5	1.6	1.1	2.4	1.9	1.2	0.8	2.9	1.3	1.0	0.8
May	0.5	0.3	0.7	0.5	3.4	2.0	3.7	2.2	0.8	0.5	1.0	0.7	0.6	0.4
June	0.8	0.5	0.9	0.6	1.9	1.3	2.9	1.1	1.7	0.7	1.2	0.8	0.4	0.3
July	0.2	0.1	0.3	0.2	1.0	0.8	*	3.4	0.6	0.4	0.7	0.6	0.8	0.7
August	1.0	0.7	0.9	0.6	2.2	1.7	*	8.6	*	2.0	5.8	3.2	1.1	0.8
September	0.8	0.6	1.3	1.0	2.6	1.9	*	7.7	3.6	1.9	*	5.0	0.9	0.6
October	1.0	0.7	1.0	0.7	1.2	0.9	3.1	1.9	3.2	2.0	2.5	1.7	1.0	0.8
November	2.2	1.4	*	3.7	3.2	2.1	5.3	3.1	*	3.9	3.7	2.3	2.2	1.5
December	1.1	0.8	1.8	1.2	2.1	1.4	1.7	1.3	2.5	1.5	*	8.2	1.3	0.9
Annual average	**1.1**		**1.2**		**2.4**		**2.9**		**2.2**		**2.9**		**1.2**	
Annual criteria	**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**	

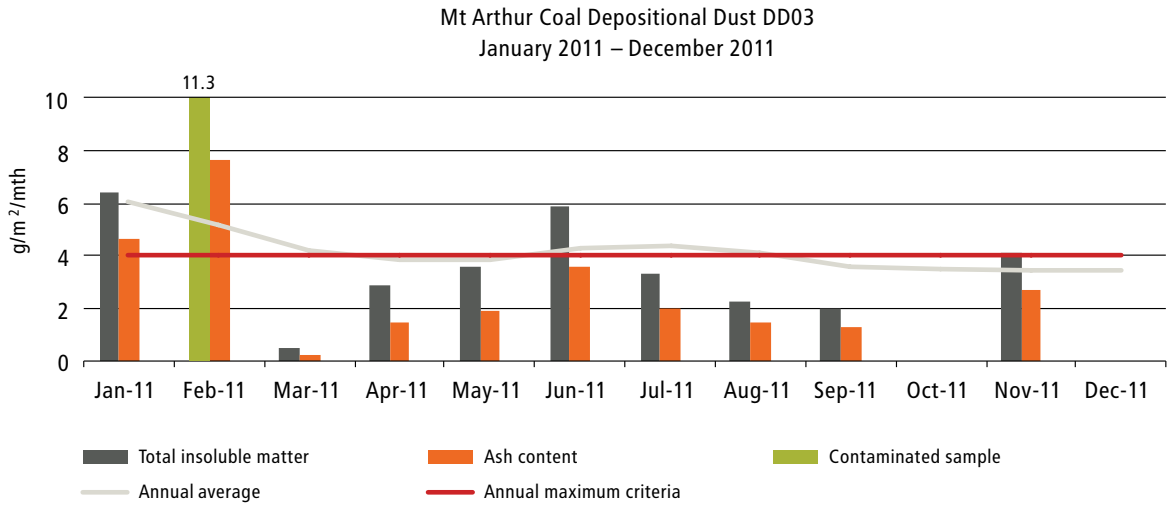
	DD15		DD16		DD17		DD18		DD19		DD20		DD21	
	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)	Total insoluble matter ($g/m^2/mth$)	Ash content ($g/m^2/mth$)
January	1.8	1.3	4.5	3.4	1.6	1.1	2.7	2.0	2.4	1.6	3.6	2.6	1.8	1.4
February	2.4	1.8	*	7.6	3.3	2.4	4.1	3.0	4.4	2.7	4.5	3.4	2.8	2.0
March	3.2	2.2	*	4.5	3.2	2.3	3.2	2.3	3.1	2.0	4.7	3.5	1.6	1.1
April	1.6	1.2	5.5	4.4	1.3	1.0	2.3	1.5	1.1	0.8	1.3	1.1	0.9	0.7
May	1.3	0.9	3.4	2.5	1.5	1.1	2.1	1.5	1.9	1.3	2.9	2.1	0.9	0.6
June	1.1	0.8	5.5	4.1	3.6	2.7	2.4	1.7	3.0	2.5	2.3	1.7	1.9	1.3
July	0.7	0.5	3.6	2.9	1.6	1.2	1.8	1.4	2.0	1.5	2.8	2.2	1.6	1.1
August	1.5	1.1	4.8	3.6	*	4.7	2.1	1.5	2.9	2.1	2.7	2.0	1.4	1.0
September	2.0	1.4	4.9	3.7	2.2	1.6	2.0	1.4	2.0	1.5	2.2	1.6	1.5	1.1
October	2.5	2.0	5.4	4.1	2.0	1.4	1.7	1.2	2.4	1.8	1.7	1.3	1.8	1.3
November	4.4	3.0	6.7	5.2	3.3	2.2	3.3	2.2	3.7	2.6	2.9	2.2	2.2	1.4
December	1.8	1.3	6.5	5.2	2.8	1.9	1.4	1.0	2.6	1.6	3.0	2.1	1.3	0.8
Annual average	**2.0**		**5.1**		**2.4**		**2.4**		**2.6**		**2.9**		**1.6**	
Annual criteria	**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**		**4.0**	

** Refer to Table 6 in section 3.3.2 of text for explanation of contaminated result.*
*** Refer section 3.3.2 of text for explanation of missing result.*

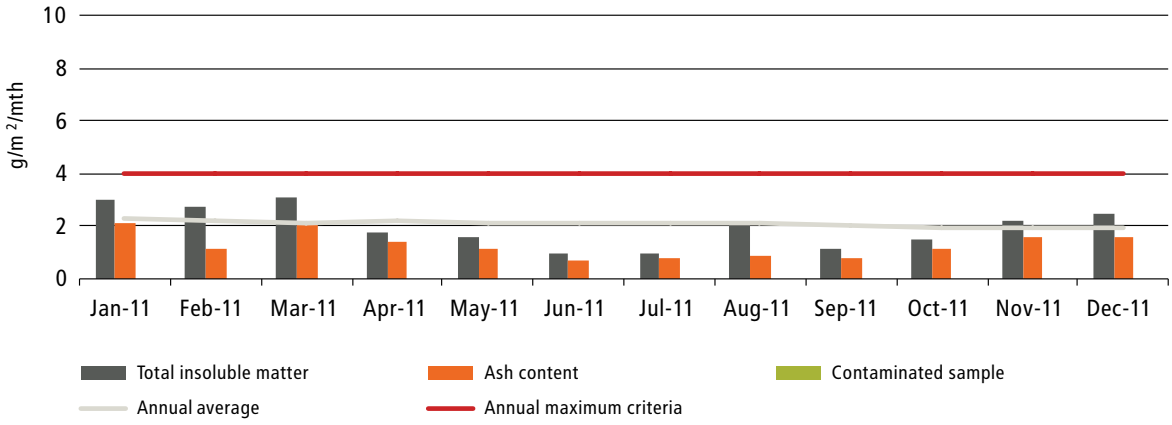
Depositional Dust Graphs



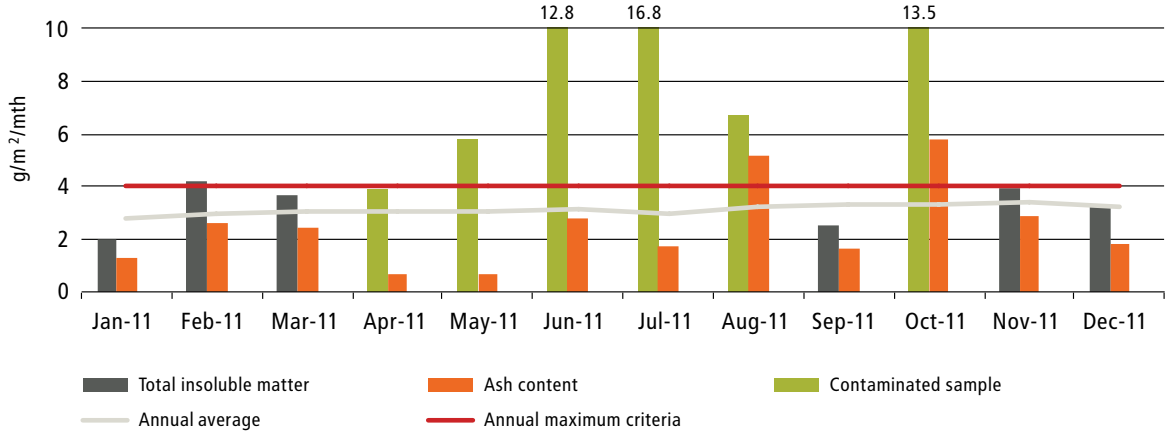




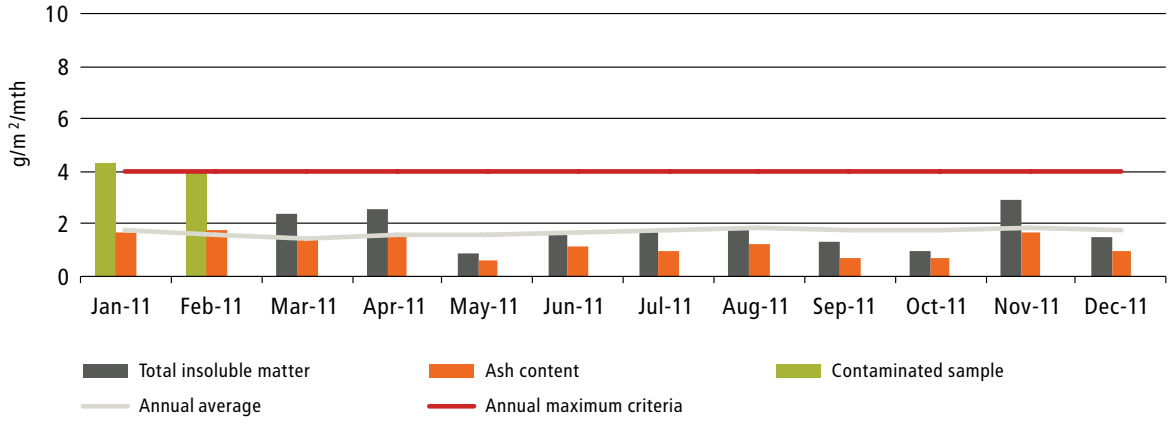
Mt Arthur Coal Depositional Dust DD04
January 2011 – December 2011

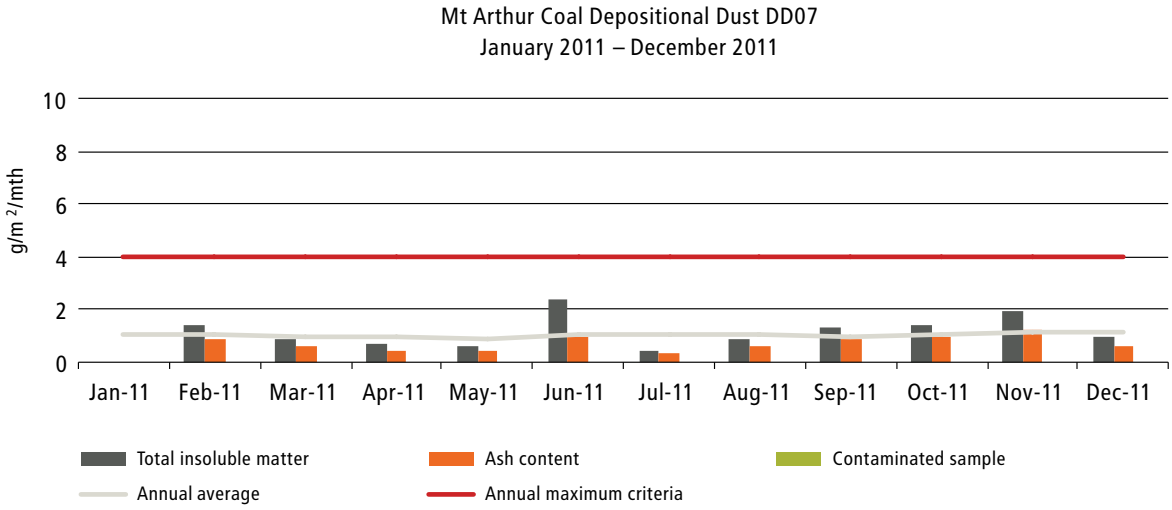


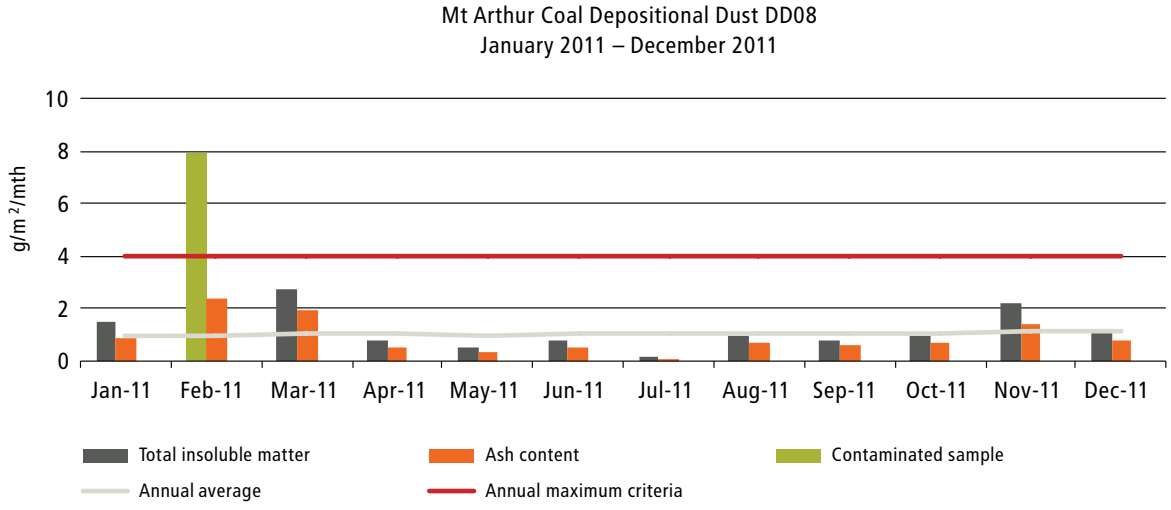
Mt Arthur Coal Depositional Dust DD05
January 2011 – December 2011

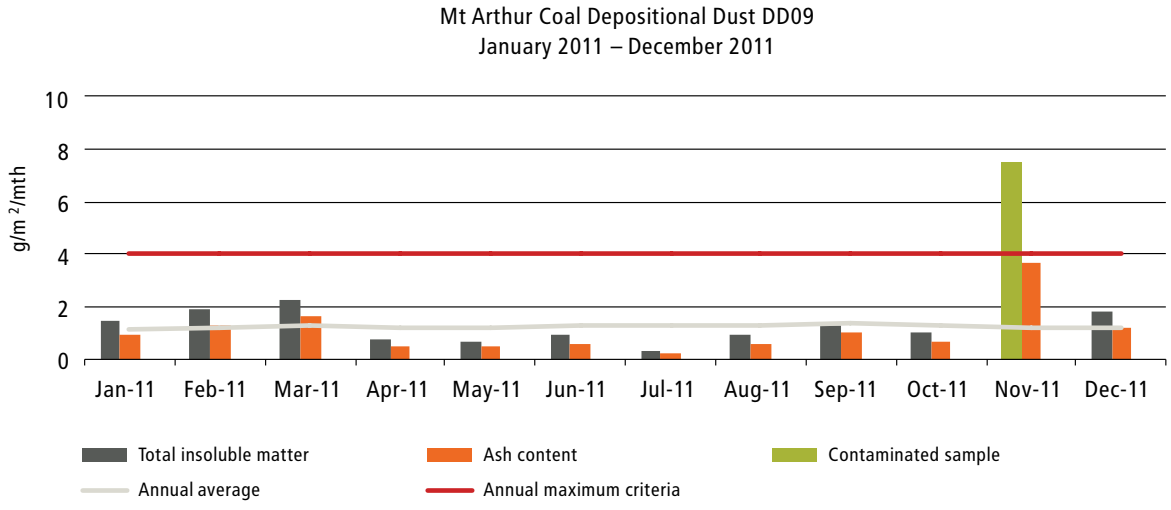


Mt Arthur Coal Depositional Dust DD06
January 2011 – December 2011

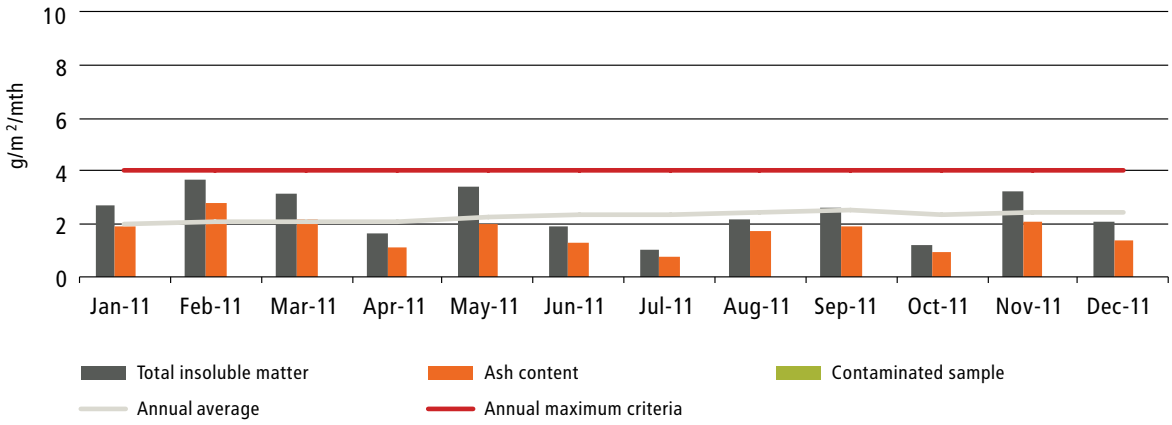



Mt Arthur Coal Depositional Dust DD07
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria

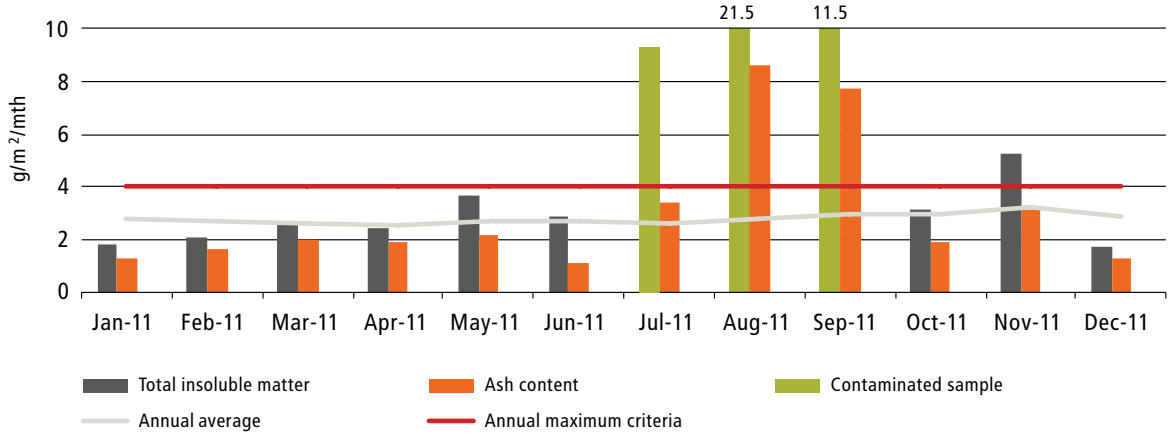

Mt Arthur Coal Depositional Dust DD08
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria


Mt Arthur Coal Depositional Dust DD09
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria

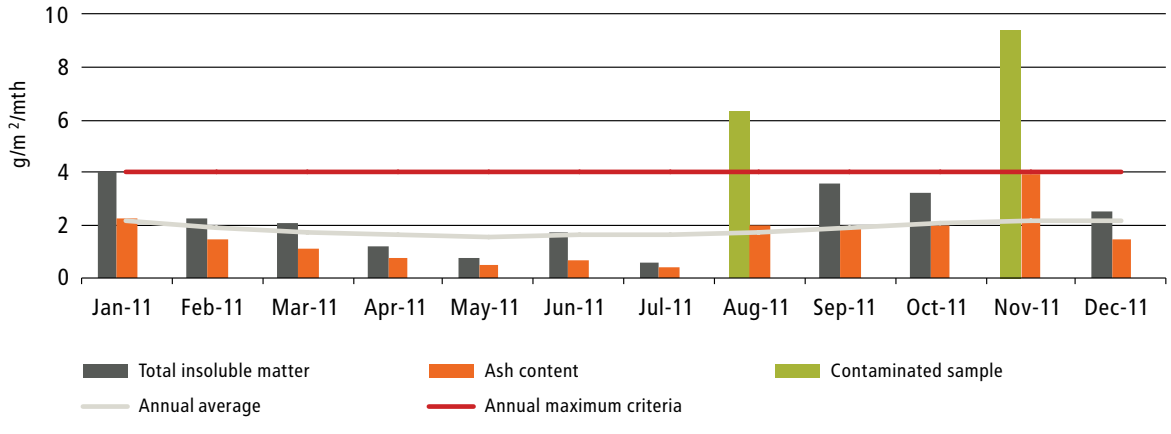
Mt Arthur Coal Depositional Dust DD10
January 2011 – December 2011



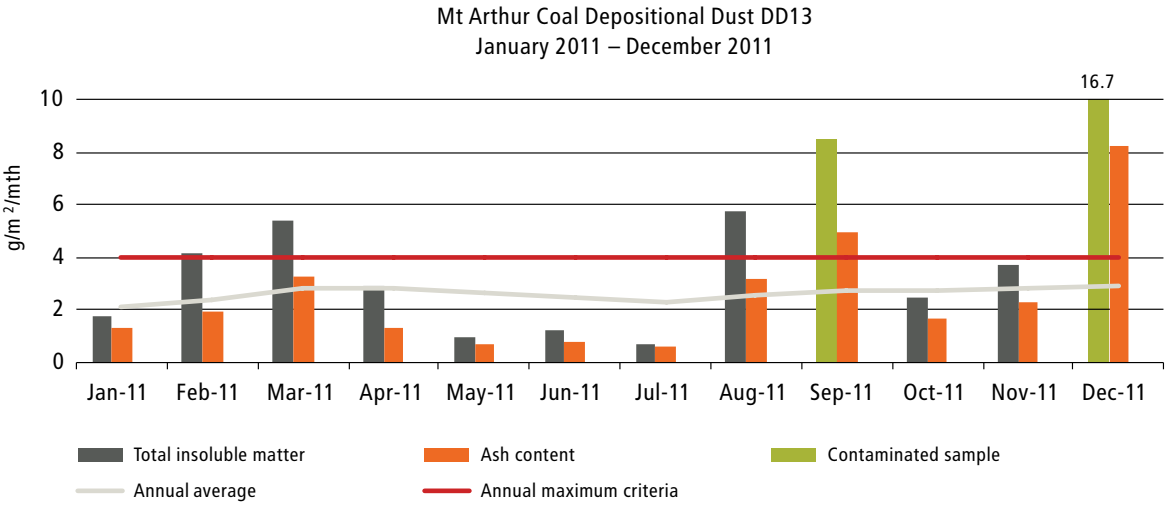
Mt Arthur Coal Depositional Dust DD11
January 2011 – December 2011

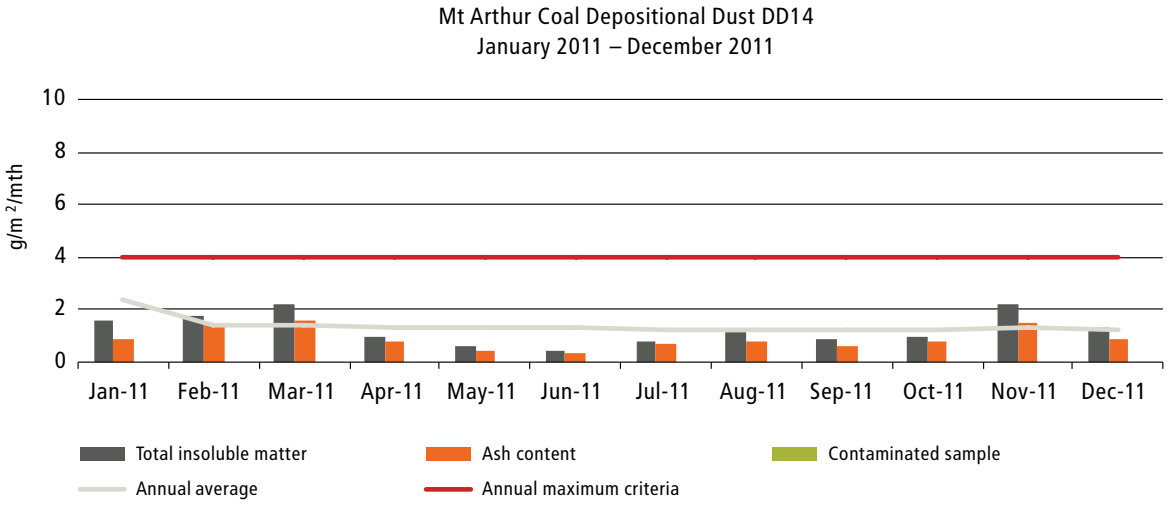


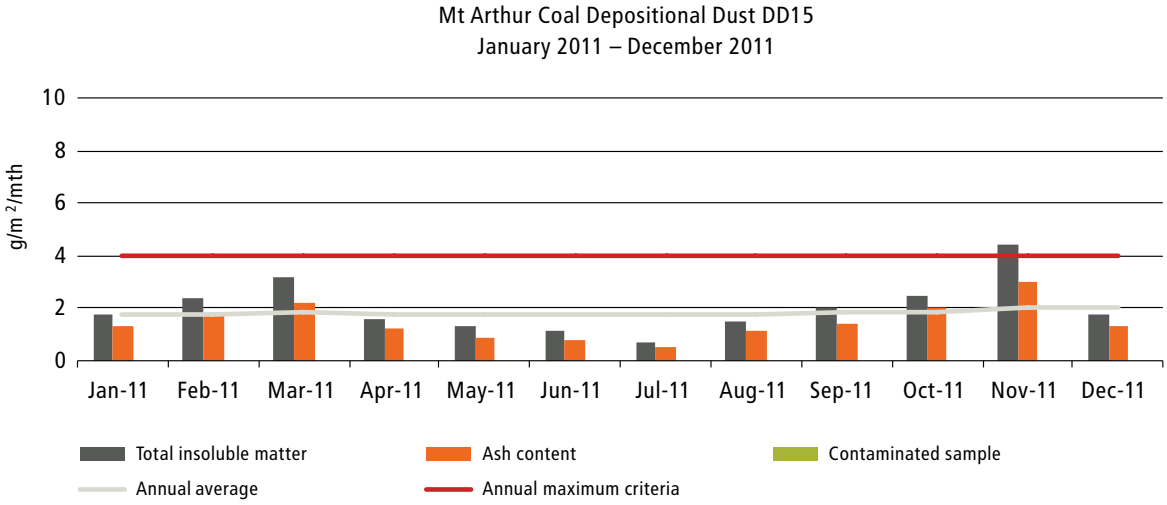
Mt Arthur Coal Depositional Dust DD12
January 2011 – December 2011



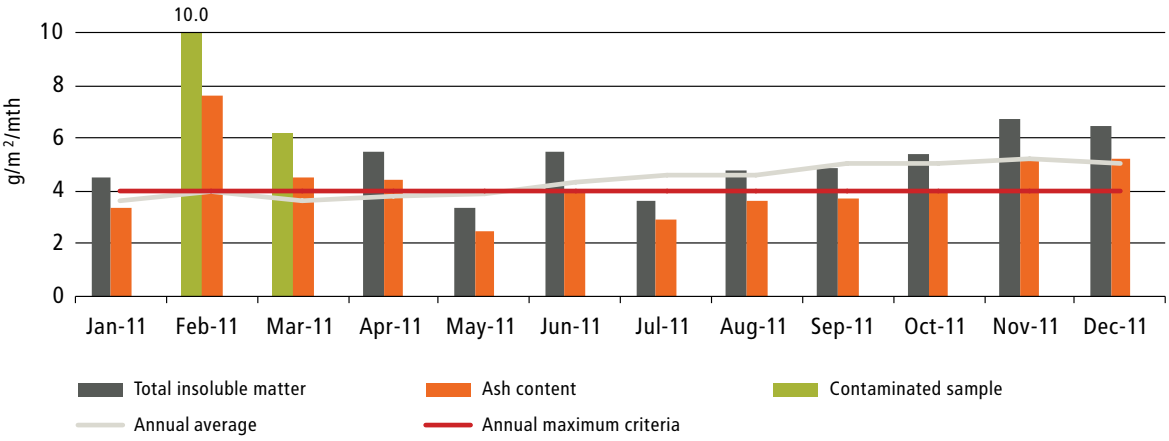
Appendix 4 – Air Quality Monitoring Results continued



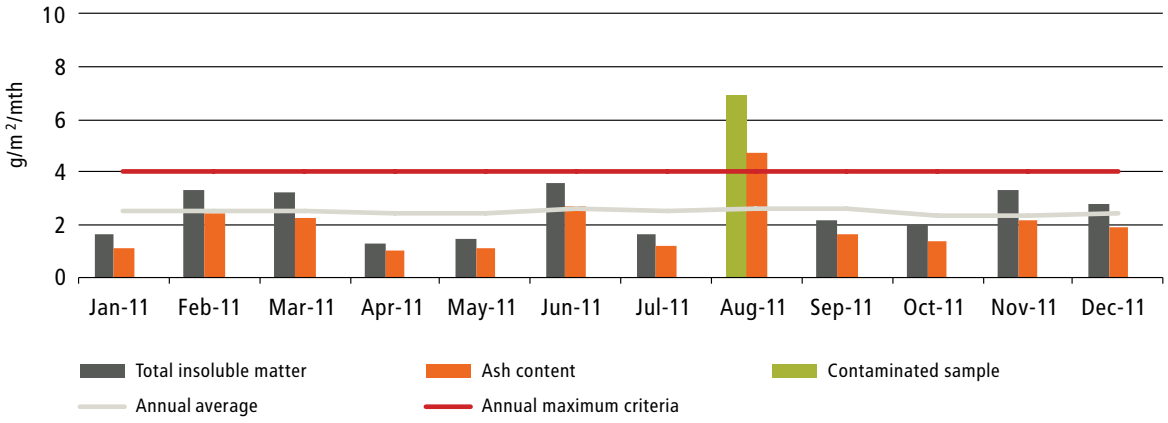




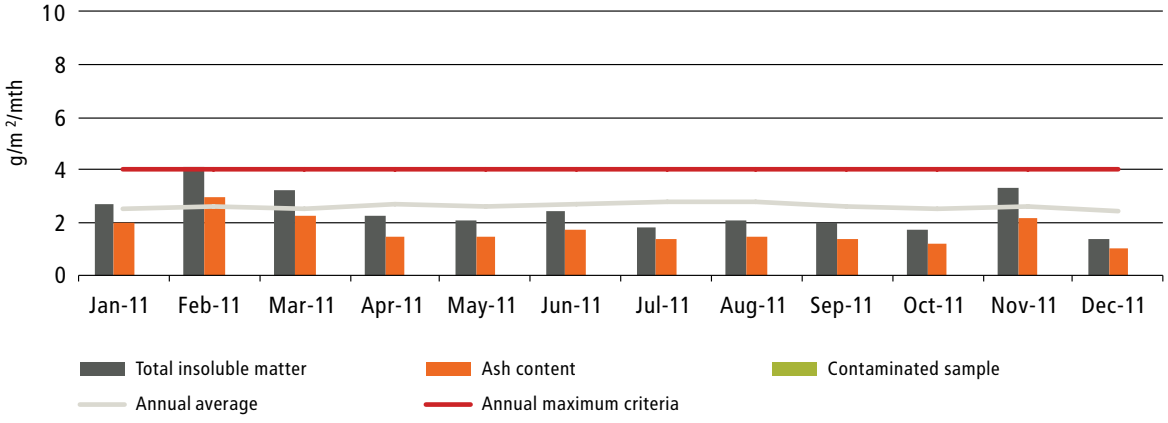
Mt Arthur Coal Depositional Dust DD16
January 2011 – December 2011

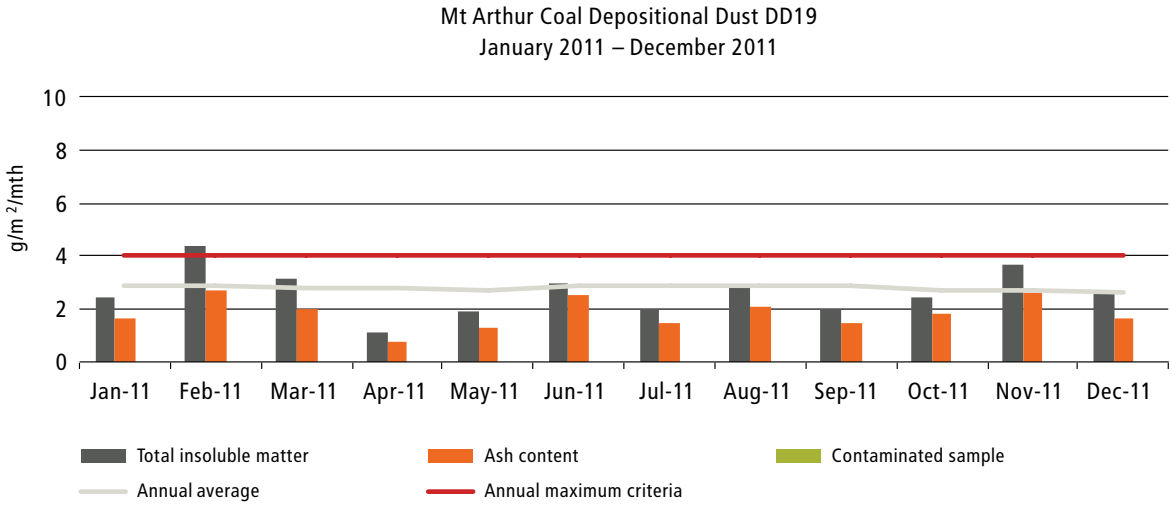


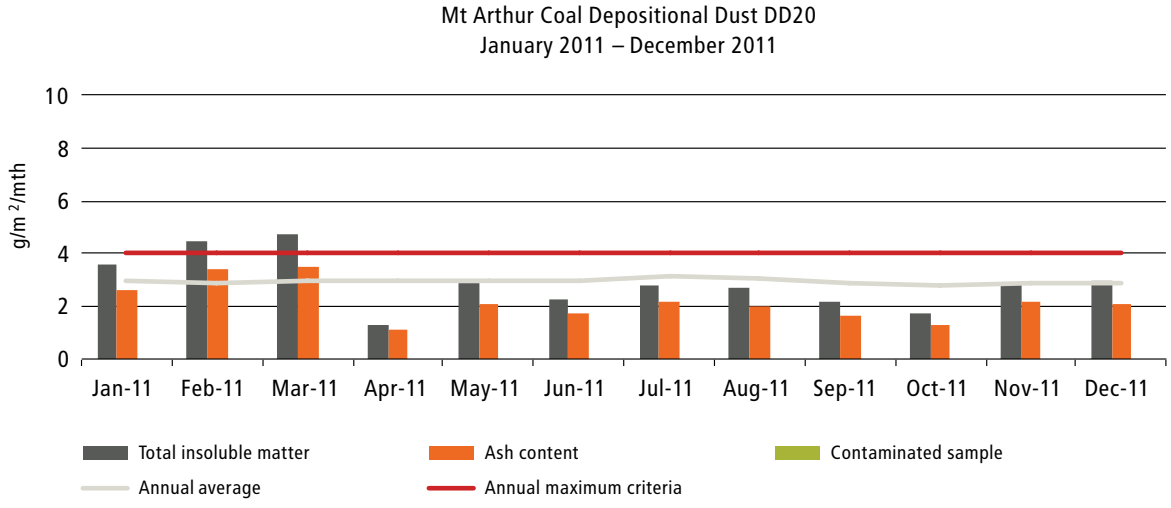
Mt Arthur Coal Depositional Dust DD17
January 2011 – December 2011

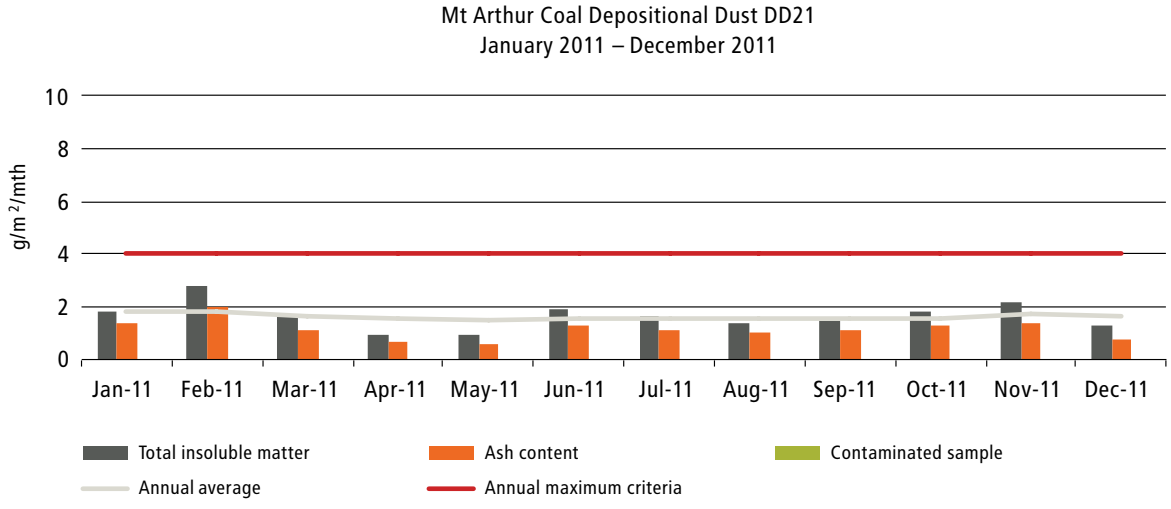


Mt Arthur Coal Depositional Dust DD18
January 2011 – December 2011




Mt Arthur Coal Depositional Dust DD19
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria


Mt Arthur Coal Depositional Dust DD20
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria


Mt Arthur Coal Depositional Dust DD21
January 2011 – December 2011
g/m 2/mth
10
8
6
4
2
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
Total insoluble matter
Ash content
Contaminated sample
Annual average
Annual maximum criteria

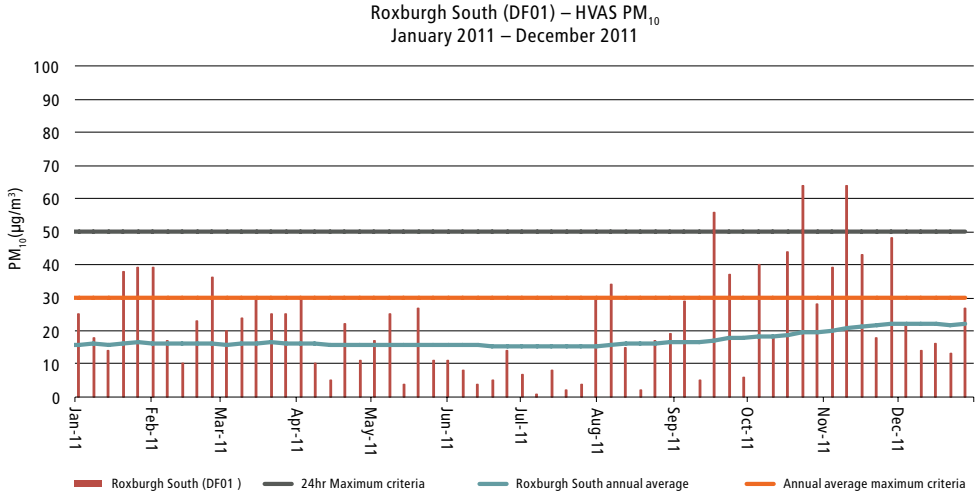
High Volume Air Sampler Monitoring Data

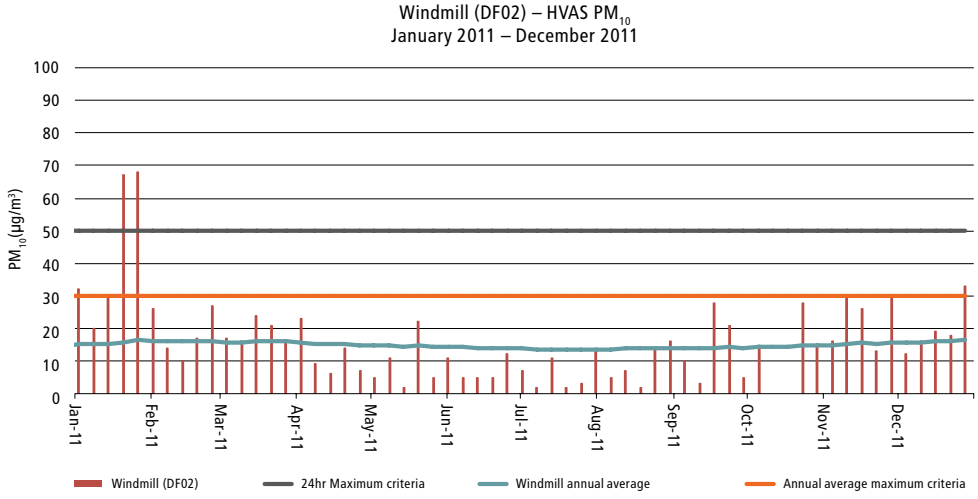
Date	DF01 Roxburgh South	DF02 Windmill	DF03 Edderton	DF04 Pistol Club	DF05 Constable	DF06 Sheppard Avenue	DF07 South Muswellbrook	DF08 Denman Road West	24-hour criteria
2/01/11	25.0	32.0	34.0	39.0	30.0	38.0	50.0	35.0	50.0
8/01/11	18.0	20.0	14.0	23.0	21.0	14.0	20.0	23.0	50.0
14/01/11	14.0	30.0	16.0	38.0	14.0	16.0	24.0	18.0	50.0
20/01/11	38.0	67.0	32.0	44.0	25.0	15.0	46.0	44.0	50.0
26/01/11	39.0	68.0	33.0	42.0	39.0	50.0	42.0	45.0	50.0
1/02/11	39.0	26.0	34.0	29.0	41.0	50.0	41.0	55.0	50.0
7/02/11	17.0	14.0	11.0	23.0	24.0	18.0	19.0	22.0	50.0
13/02/11	10.0	10.0	7.0	19.0	10.0	17.0	13.0	14.0	50.0
19/02/11	23.0	17.0	20.0	25.0	18.0	13.0	21.0	37.0	50.0
25/02/11	36.0	27.0	27.0	43.0	29.0	31.0	27.0	38.0	50.0
3/03/11	20.0	17.0	18.0	29.0	18.0	18.0	24.0	40.0	50.0
9/03/11	24.0	16.0	17.0	27.0	17.0	50.0	25.0	37.0	50.0
15/03/11	30.0	24.0	21.0	30.0	27.0	25.0	30.0	34.0	50.0
21/03/11	25.0	21.0	13.0	21.0	19.0	9.0	16.0	27.0	50.0
27/03/11	25.0	16.0	10.0	19.0	18.0	8.0	19.0	34.0	50.0
2/04/11	30.0	23.0	24.0	37.0	32.0	22.0	47.0	49.0	50.0
8/04/11	10.0	9.0	6.0	23.0	11.0	18.0	17.0	16.0	50.0
14/04/11	5.0	6.0	7.0	20.0	7.0	33.0	14.0	15.0	50.0
20/04/11	22.0	14.0	18.0	21.0	19.0	36.0	24.0	23.0	50.0
26/04/11	11.0	7.0	6.0	14.0	7.0	15.0	9.0	15.0	50.0
2/05/11	17.0	5.0	15.0	11.0	9.0	12.0	11.0	14.0	50.0
8/05/11	25.0	11.0	12.0	29.0	18.0	29.0	28.0	20.0	50.0
14/05/11	4.0	2.0	3.0	10.0	3.0	27.0	19.0	10.0	50.0
20/05/11	27.0	22.0	23.0	26.0	35.0	35.0	32.0	28.0	50.0
26/05/11	11.0	5.0	6.0	17.0	5.0	21.0	25.0	5.0	50.0
1/06/11	11.0	11.0	3.0	18.0	9.0	13.0	17.0	13.0	50.0
7/06/11	8.0	5.0	5.0	9.0	5.0	13.0	12.0	8.0	50.0
13/06/11	4.0	5.0	4.0	14.0	5.0	13.0	13.0	6.0	50.0
19/06/11	5.0	5.0	5.0	5.0	3.0	6.0	12.0	6.0	50.0
25/06/11	14.0	12.0	11.0	18.0	18.0	12.0	24.0	12.0	50.0
1/07/11	7.0	7.0	6.0	15.0	18.0	13.0	22.0	14.0	50.0
7/07/11	1.0	2.0	1.0	5.0	7.0	11.0	13.0	2.0	50.0
13/07/11	8.0	11.0	8.0	14.0	9.0	14.0	11.0	13.0	50.0
19/07/11	2.0	2.0	2.0	4.0	3.0	3.0	4.0	7.0	50.0
25/07/11	4.0	3.0	3.0	4.0	6.0	8.0	6.0	5.0	50.0
31/07/11	30.0	13.0	9.0	11.0	9.0	16.0	21.0	15.0	50.0
6/08/11	34.0	5.0	17.0	8.0	13.0	35.0	16.0	13.0	50.0
12/08/11	15.0	7.0	5.0	21.0	13.0	17.0	19.0	15.0	50.0
18/08/11	2.0	2.0	1.0	15.0	9.0	8.0	5.0	4.0	50.0
24/08/11	17.0	14.0	8.0	25.0	15.0	15.0	16.0	13.0	50.0
30/08/11	19.0	16.0	24.0	28.0	22.0	26.0	24.0	21.0	50.0
5/09/11	29.0	10.0	22.0	17.0	18.0	21.0	19.0	19.0	50.0
11/09/11	5.0	3.0	5.0	5.0	1.0	6.0	10.0	6.0	50.0
17/09/11	56.0	28.0	21.0	11.0	17.0	18.0	27.0	36.0	50.0
23/09/11	37.0	21.0	23.0	35.0	35.0	103.0	38.0	32.0	50.0
29/09/11	6.0	5.0	4.0	7.0	9.0	11.0	9.0	11.0	50.0
5/10/11	40.0	15.0	19.0	24.0	22.0	10.0	17.0	31.0	50.0
11/10/11	18.0	*	7.0	13.0	5.0	5.0	12.0	7.0	50.0
17/10/11	44.0	*	16.0	25.0	33.0	13.0	27.0	37.0	50.0
23/10/11	64.0	28.0	35.0	26.0	33.0	33.0	25.0	34.0	50.0
29/10/11	28.0	15.0	17.0	15.0	13.0	12.0	15.0	14.0	50.0
4/11/11	39.0	16.0	17.0	24.0	32.0	22.0	22.0	30.0	50.0
10/11/11	64.0	30.0	26.0	47.0	28.0	32.0	33.0	39.0	50.0
16/11/11	43.0	26.0	23.0	24.0	28.0	16.0	27.0	56.0	50.0
22/11/11	18.0	13.0	13.0	*	15.0	22.0	19.0	15.0	50.0
28/11/11	48.0	30.0	23.0	*	34.0	22.0	24.0	33.0	50.0
4/12/11	22.0	12.0	13.0	15.0	11.0	41.0	16.0	15.0	50.0
10/12/11	14.0	16.0	10.0	15.0	15.0	16.0	13.0	16.0	50.0
16/12/11	16.0	19.0	11.0	24.0	19.0	19.0	17.0	21.0	50.0
22/12/11	13.0	18.0	9.0	18.0	16.0	19.0	16.0	23.0	50.0
28/12/11	27.0	33.0	21.0	27.0	29.0	27.0	28.0	31.0	50.0
Annual average	**22.2**	**16.4**	**14.3**	**21.1**	**17.6**	**21.5**	**21.2**	**22.5**	
Annual average criteria	**30.0**	**30.0**	**30.0**	**30.0**	**30.0**	**30.0**	**30.0**	**30.0**	

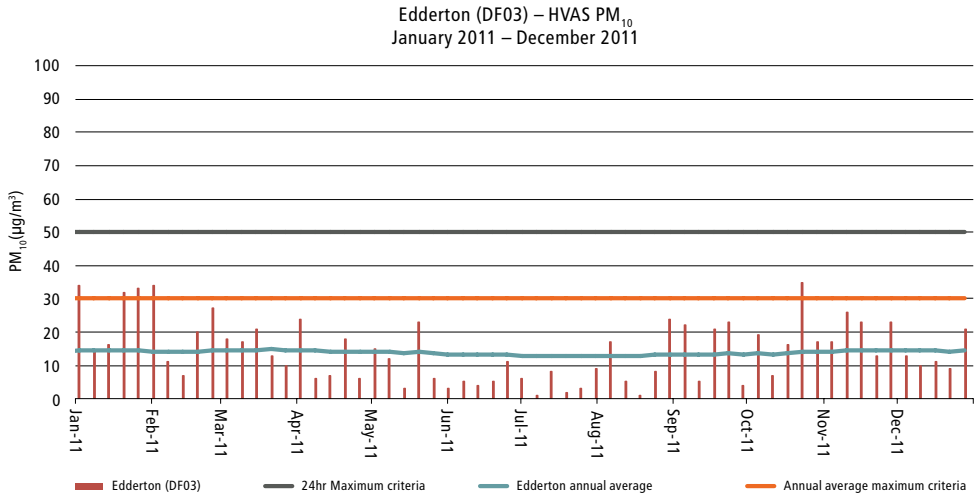
** Refer to section 3.3.2 of text for explanation of missing result.*

Appendix 4 – Air Quality Monitoring Results continued

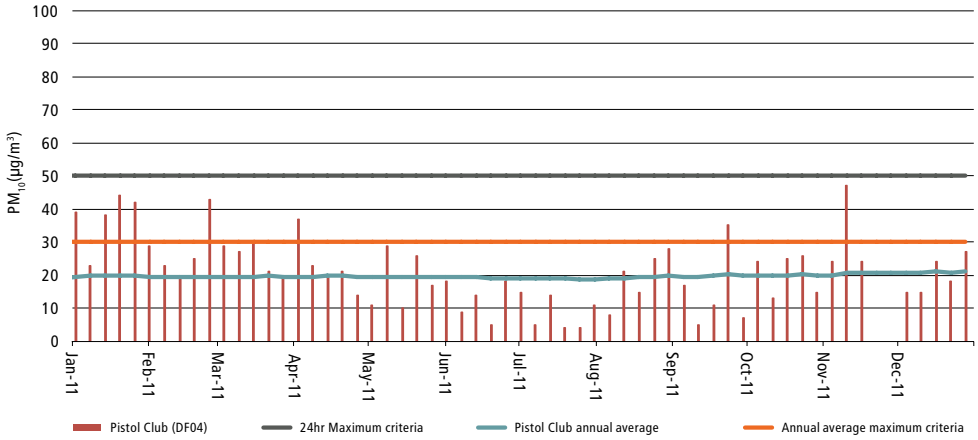
High Volume Air Sampler Graphs



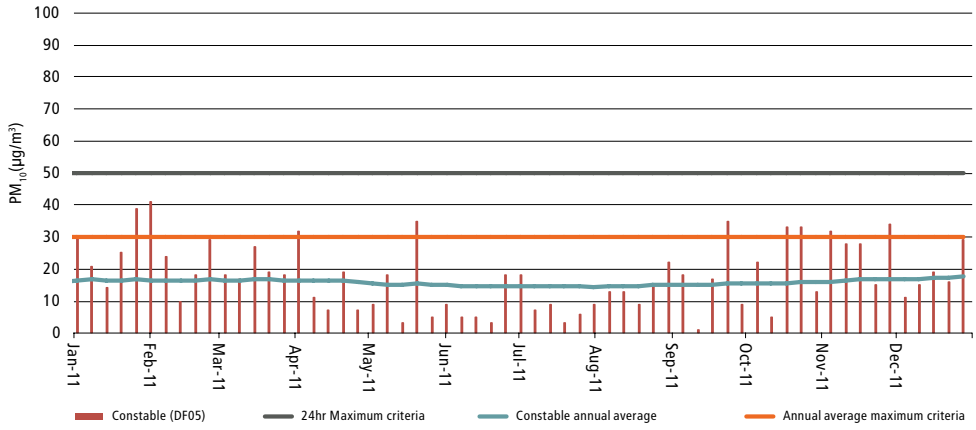




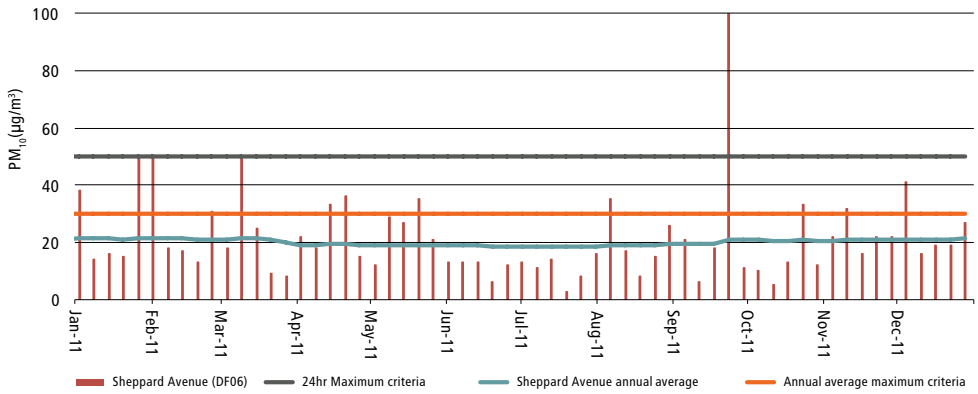
Pistol Club (DF04) – HVAS PM_{10}
January 2011 – December 2011



Constable (DF05) – HVAS PM_{10}
January 2011 – December 2011

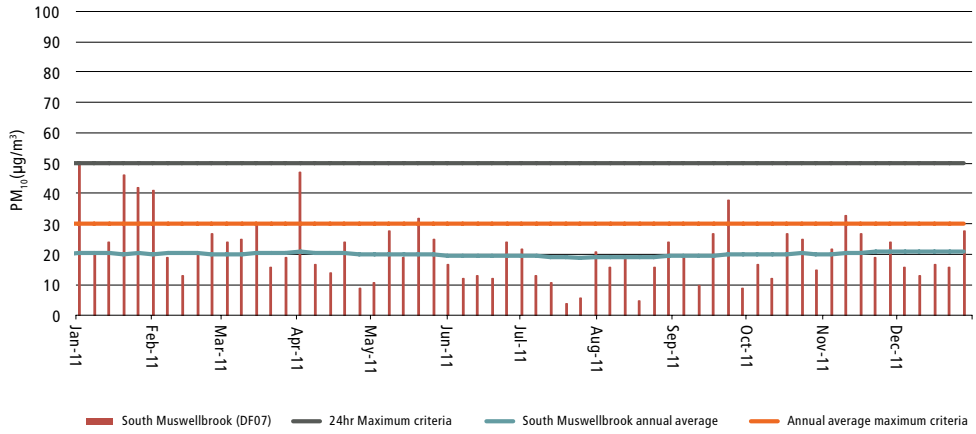


Sheppard Avenue (DF06) – HVAS PM_{10}
January 2011 – December 2011

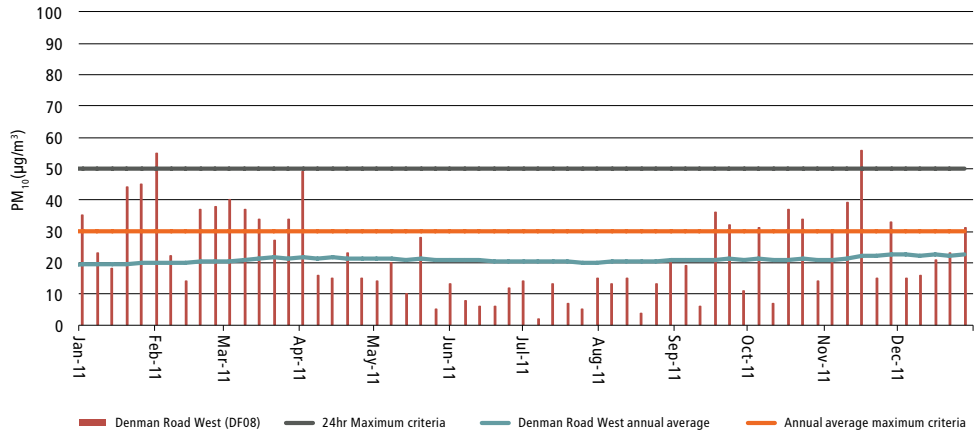


Appendix 4 – Air Quality Monitoring Results continued

South Muswellbrook (DF07) – HVAS PM_{10}
January 2011 – December 2011

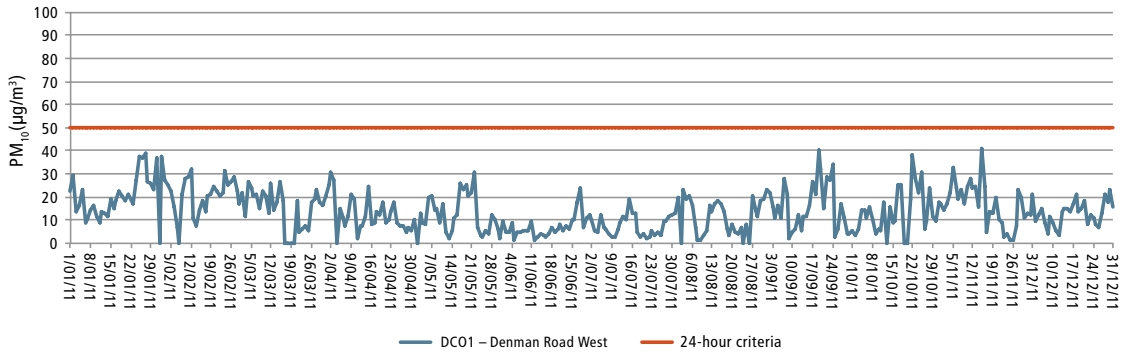


Denman Road West (DF08) – HVAS PM_{10}
January 2011 – December 2011

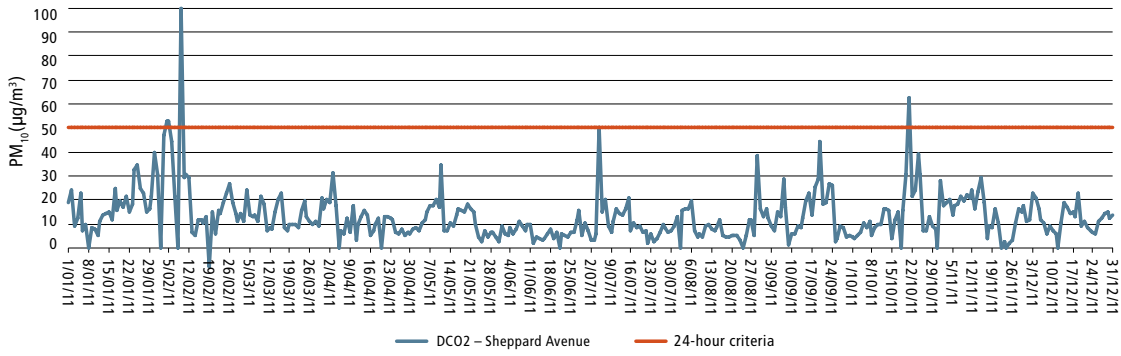


Real-time Air Quality Monitor (TEOM) Graphs

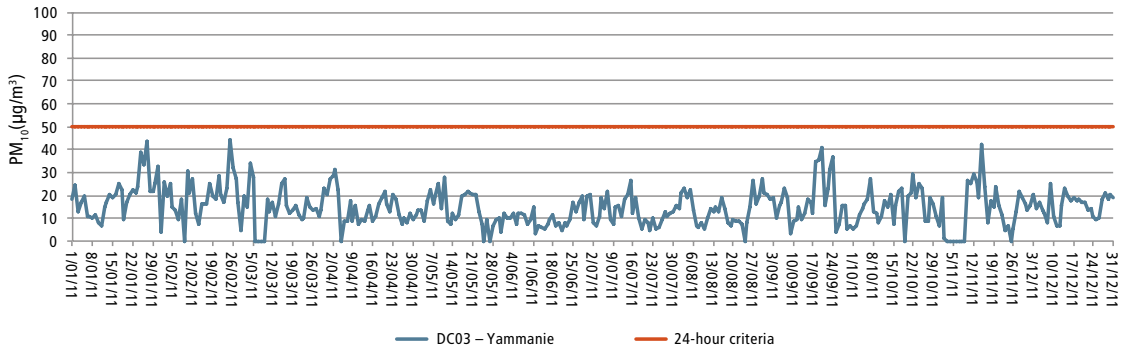
Mt Arthur Coal TEOM PM_{10} – Denman Road West (DC01)
January 2011 – December 2011



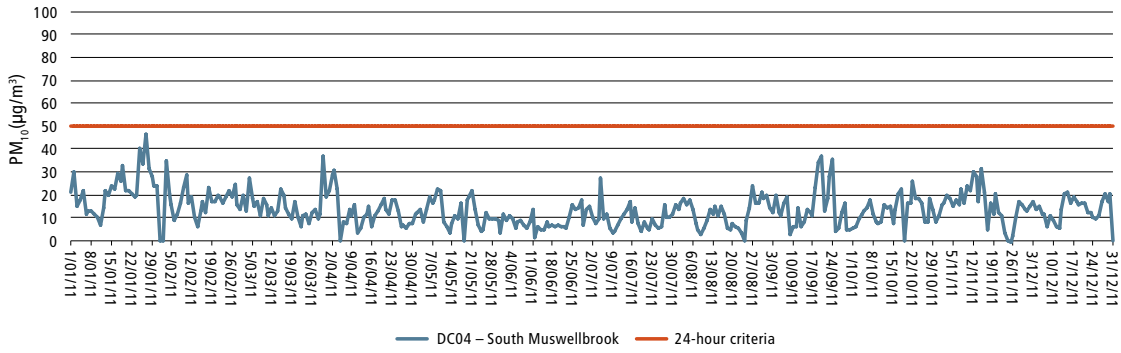
Mt Arthur Coal TEOM PM_{10} – Sheppard Avenue (DC02)
January 2011 – December 2011



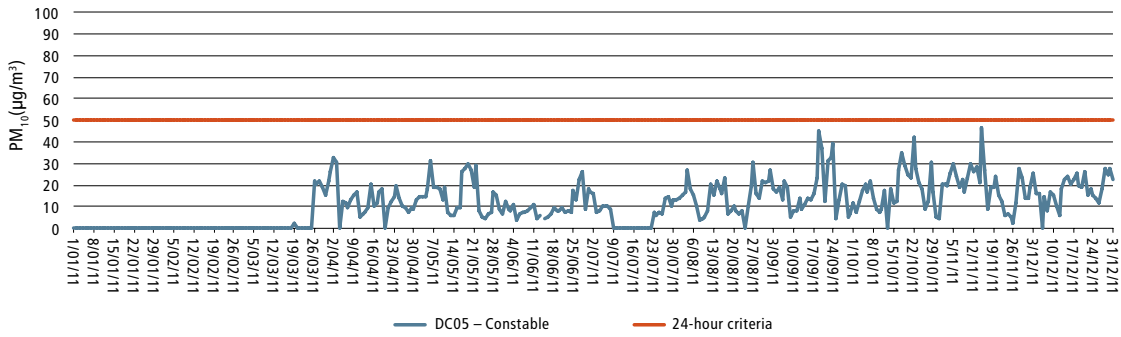
Mt Arthur Coal TEOM PM_{10} – Yammanie (DC03)
January 2011 – December 2011



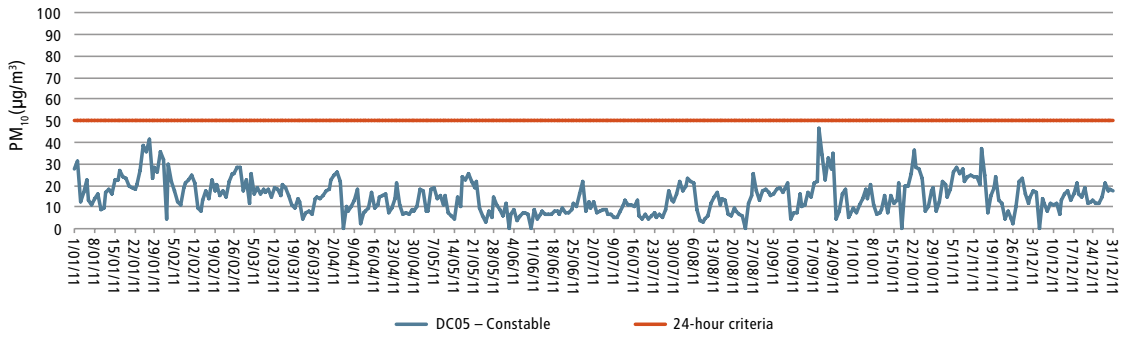
Mt Arthur Coal TEOM PM_{10} – South Muswellbrook (DC04)
January 2011 – December 2011



Mt Arthur Coal TEOM PM_{10} – Constable (DC05)
January 2011 – December 2011



Mt Arthur Coal TEOM PM_{10} – Edderton (DC06)
January 2011 – December 2011



Appendix 5 – Noise Monitoring Results

Noise Monitoring Data

	Denamn Road West (NC01)			Sheppard Avenue (NC02)			Yammnaie (NC03)			South Muswellbrook (NC04)			
	LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			
Date*	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Limit of LAeq (15 min) results over criteria due to mining noise (%)
2/03/11	-	6.3%	-	-	-	-	-	-	-	-	-	-	10%
5/03/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
6/03/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
31/03/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
3/04/11	-	-	22.2%	-	-	-	-	-	-	-	-	-	10%
5/04/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
6/04/11	-	-	13.9%	-	-	-	-	-	-	-	-	-	10%
7/04/11	2.3%	-	2.8%	-	-	-	-	-	-	-	-	-	10%
8/04/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
9/04/11	-	-	25.0%	-	-	-	-	-	-	-	-	-	10%
10/04/11	4.5%	-	-	-	-	-	-	-	-	-	-	-	10%
15/04/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
17/04/11	-	-	41.7%	-	-	-	-	-	-	-	-	-	10%
18/04/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
21/04/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
22/04/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
23/04/11	4.5%	-	2.8%	-	-	-	-	-	-	-	-	-	10%
26/04/11	-	-	22.2%	-	-	-	-	-	-	-	-	-	10%
27/04/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
28/04/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
29/04/11	-	6.3%	2.8%	-	-	-	-	-	-	-	-	-	10%
1/05/11	-	6.3%	2.8%	-	-	-	-	-	-	-	-	-	10%
2/05/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
3/05/11	-	-	11.1%	-	-	-	-	-	-	-	-	-	10%
4/05/11	-	-	22.2%	-	-	-	-	-	-	-	-	-	10%
5/05/11	-	6.3%	30.6%	-	-	-	-	-	-	-	-	-	10%
6/05/11	-	-	5.6%	-	-	2.8%	-	-	-	-	-	-	10%
9/05/11	2.3%	-	8.3%	-	-	-	-	-	-	-	-	-	10%
10/05/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
12/05/11	-	-	-	-	-	-	-	-	-	-	6.3%	-	10%
14/05/11	-	-	-	-	-	-	-	-	-	-	6.3%	-	10%
17/05/11	-	6.3%	44.4%	-	-	-	-	-	2.8%	-	-	-	10%
18/05/11	-	-	41.7%	-	-	-	-	-	-	-	-	-	10%
19/05/11	-	6.3%	5.6%	-	-	-	-	-	-	-	-	-	10%
20/05/11	-	18.8%	5.6%	-	-	-	-	-	-	-	-	-	10%
21/05/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
22/05/11	-	-	19.4%	2.3%	-	-	-	-	-	-	-	-	10%
26/05/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
27/05/11	-	-	-	-	-	-	2.3%	-	-	-	-	-	10%
29/05/11	-	-	19.4%	-	-	-	-	-	-	-	-	-	10%
10/06/11	-	-	22.2%	-	-	-	-	-	-	-	-	-	10%
13/06/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
1/07/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
14/07/11	-	-	16.7%	-	-	-	-	-	-	-	-	-	10%
15/07/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
16/07/11	-	-	30.6%	-	-	-	-	-	-	-	-	-	10%
17/07/11	-	6.3%	8.3%	-	-	-	-	-	-	-	-	-	10%
23/07/11	-	12.5%	2.8%	-	-	-	-	-	-	-	-	-	10%
4/08/11	2.3%	6.3%	2.8%	-	-	-	-	-	-	-	-	-	10%
12/08/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%

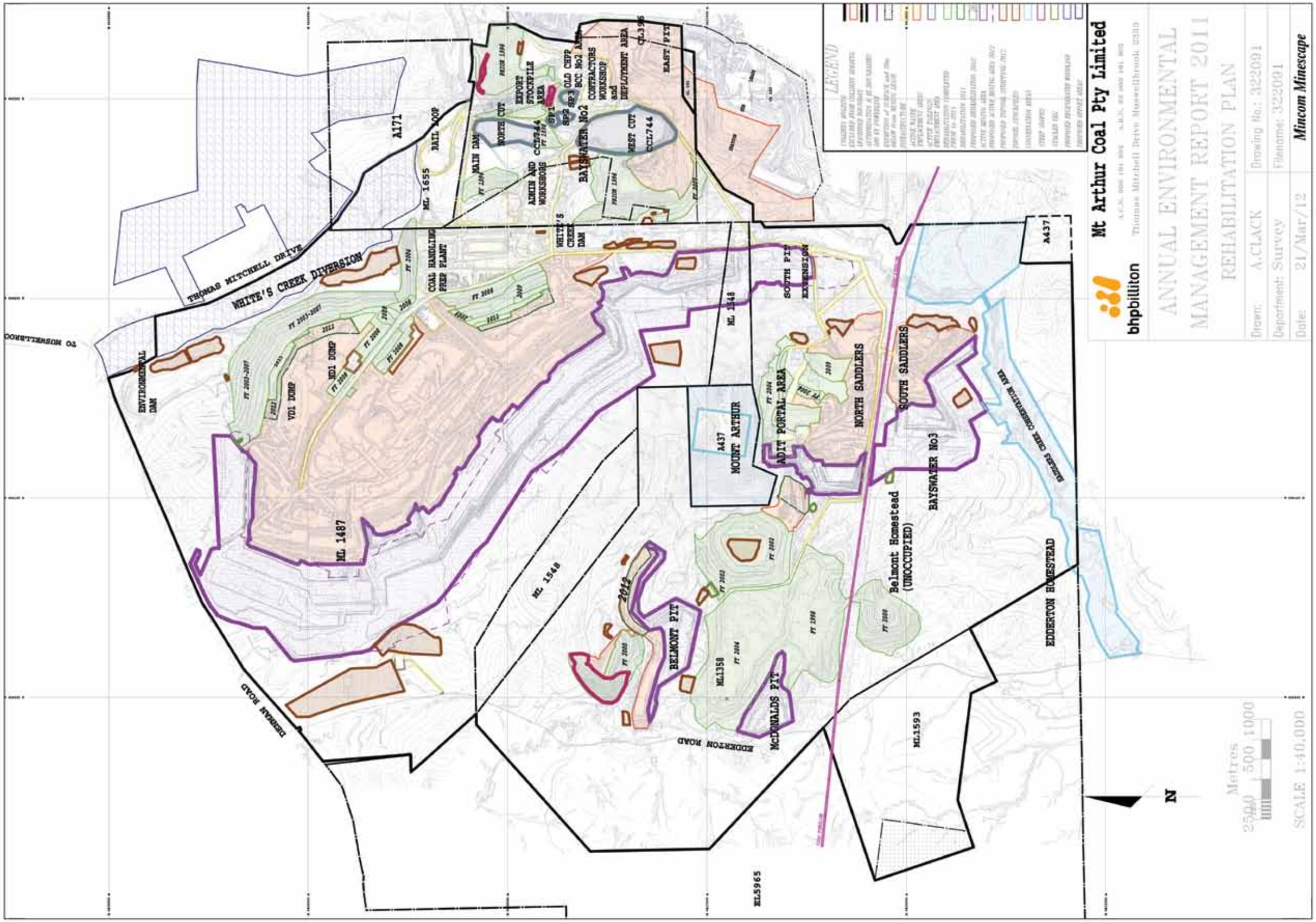
Appendix 5 – Noise Monitoring Results continued

	Denamn Road West (NC01)			Sheppard Avenue (NC02)			Yammnaie (NC03)			South Muswellbrook (NC04)			
	LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			LAeq (15 min) results over criteria due to mining noise (%)			
Date*	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Day (7am - 6pm)	Evening (6pm - 10pm)	Night (10pm - 7am)	Limit of LAeq (15 min) results over criteria due to mining noise (%)
13/08/11	-	-	25.0%	-	-	-	-	-	-	-	-	-	10%
21/08/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
24/08/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
28/08/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
29/08/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
31/08/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
1/09/11	-	-	13.9%	-	-	-	-	-	-	-	-	-	10%
2/09/11	2.3%	-	-	-	-	-	-	-	-	-	-	-	10%
3/09/11	-	37.5%	50.0%	-	-	-	-	-	-	-	-	-	10%
5/09/11	-	-	5.6%	-	-	-	-	-	-	-	-	2.8%	10%
7/09/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
11/09/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
14/09/11	-	-	2.8%	-	-	-	-	-	-	-	-	8.3%	10%
15/09/11	-	-	2.8%	-	-	-	-	-	-	-	12.5%	8.3%	10%
21/09/11	-	6.3%	-	-	-	-	-	-	-	-	6.3%	-	10%
26/09/11	-	-	22.2%	-	-	-	-	-	-	-	-	-	10%
30/09/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
1/10/11	4.5%	-	-	-	-	-	-	-	-	-	-	-	10%
3/10/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
4/10/11	-	-	41.7%	-	-	-	-	-	-	-	-	-	10%
17/10/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
18/10/11	-	-	5.6%	-	-	-	-	-	-	-	-	-	10%
12/11/11	-	-	2.8%	-	-	-	-	-	-	-	-	-	10%
10/12/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%
14/12/11	-	-	11.1%	-	-	-	-	-	-	-	-	-	10%
15/12/11	-	-	8.3%	-	-	-	-	-	-	-	-	-	10%

**Only dates when LAeq (15 minute) samples exceed the statutory limit due to mining noise are shown.*

A high noise period is deemed to have occurred when more than 10 per cent of samples in an assessment time period (day/evening/night) exceeds the statutory limit by more than 2dB due to mining activities in suitable meteorological conditions. An exceedance of a statutory limit is deemed to have occurred when eight high noise periods or more are identified for an assessment time period at a single unattended monitoring location during a rolling four week period.

Appendix 6 – Rehabilitation Plan



Flip open for Appendix 6

Appendix 7 – Water Quality Monitoring Results

Surface Water Monitoring Data

Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW1	11/01/11	7.3	7800	6060	71	9.4	1560	0.42	<0.01	<5
SW1	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW1	15/03/11	7.4	1910	1430	19	26.1	486	<0.05	0.09	<5
SW1	18/04/11	7.8	2560	1690	133	34.9	645	<0.05	3.48	<5
SW1	10/05/11	7.2	9030	6120	164	9.8	2260	<0.05	<0.01	<5
SW1	6/06/11	7.9	2410	1310	117	121.0	296	<0.05	4.35	<5
SW1	12/07/11	7.5	7520	5540	52	3.5	2680	0.12	0.23	<5
SW1	15/08/11	7.4	8760	6760	249	9.3	2670	<0.05	0.07	<5
SW1	6/09/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW1	19/10/11	8.0	6660	4980	290	228.0	1720	<0.05	0.03	<5
SW1	22/11/11	8.0	3700	2780	81	71.9	1320	<0.05	0.73	<5
SW1	13/12/11	8.0	5480	4270	58	50.2	1900	<0.05	0.09	<5
SW1	**Mean**	**7.7**	**5583.00**	**4094.00**	**123.40**	**56.41**	**1553.70**	**N/A**	**N/A**	**N/A**
SW1	**Minimum**	**7.2**	**1910.00**	**1310.00**	**19.00**	**3.50**	**296.00**	**N/A**	**N/A**	**N/A**
SW1	**Maximum**	**8.0**	**9030.00**	**6760.00**	**290.00**	**228.00**	**2680.00**	**N/A**	**N/A**	**N/A**
SW1	**Standard deviation**	**0.3**	**2749.86**	**2117.06**	**88.27**	**70.46**	**866.88**	**N/A**	**N/A**	**N/A**
SW2	11/01/11	7.3	7110	5980	63	15.5	1780	<0.50	<0.01	<5
SW2	9/02/11	7.3	11000	10100	92	0.7	4290	<0.50	<0.01	<10
SW2	15/03/11	7.5	1360	1120	26	14.1	421	<0.05	0.71	<5
SW2	18/04/11	7.6	1370	850	24	29.8	267	<0.05	0.92	<5
SW2	10/05/11	6.9	3640	2450	118	33.9	951	<0.05	0.01	<5
SW2	6/06/11	8.1	2220	1230	28	77.8	322	<0.05	3.90	<5
SW2	12/07/11	8.0	7070	5070	20	3.6	2460	0.07	0.18	<5
SW2	15/08/11	7.3	8600	6940	16	2.8	2790	<0.05	0.11	<5
SW2	6/09/11	8.1	8440	6260	44	8.3	2710	<0.05	<0.01	<5
SW2	19/10/11	8.1	7260	5840	828	765.0	1980	<0.05	0.01	<5
SW2	22/11/11	8.1	3770	2850	188	18.2	1340	<0.05	0.06	<5
SW2	13/12/11	8.1	5980	5060	12	10.5	44	0.10	0.05	<5
SW2	**Mean**	**7.7**	**5651.67**	**4479.17**	**121.58**	**81.68**	**1612.92**	**N/A**	**N/A**	**N/A**
SW2	**Minimum**	**6.9**	**1360.00**	**850.00**	**12.00**	**0.70**	**44.00**	**N/A**	**N/A**	**N/A**
SW2	**Maximum**	**8.1**	**11000.00**	**10100.00**	**828.00**	**765.00**	**4290.00**	**N/A**	**N/A**	**N/A**
SW2	**Standard deviation**	**0.4**	**3133.69**	**2818.69**	**228.57**	**216.21**	**1297.16**	**N/A**	**N/A**	**N/A**
SW3	11/01/11	No access	No access	No access	No access	No access	No access	No access	No access	No access
SW3	9/02/11	7.6	5470	3290	8	1.0	295	<0.05	<0.01	<10
SW3	15/03/11	7.8	4960	3000	29	8.0	424	<0.05	0.02	<5
SW3	18/04/11	8.0	7430	4180	11	1.7	226	<0.05	0.01	<5
SW3	10/05/11	7.5	6360	3370	32	6.5	394	<0.05	<0.01	<5
SW3	6/06/11	7.7	2420	1440	10	10.4	448	<0.05	0.20	<5
SW3	12/07/11	7.8	3740	2360	6	2.0	707	0.06	<0.01	<5
SW3	15/08/11	7.7	5010	3240	6	0.6	640	<0.05	0.05	<5
SW3	6/09/11	7.9	6490	3900	11	1.7	765	<0.05	<0.01	<5
SW3	19/10/11	7.9	5190	3450	18	10.4	876	<0.05	<0.01	<5
SW3	22/11/11	8.0	4490	3140	<5	1.3	1000	<0.05	0.06	<5
SW3	13/12/11	8.0	7530	5560	<5	1.8	50	0.10	<0.01	<5
SW3	**Mean**	**7.8**	**5371.82**	**3357.27**	**14.56**	**4.13**	**529.55**	**N/A**	**N/A**	**N/A**
SW3	**Minimum**	**7.5**	**2420.00**	**1440.00**	**6.00**	**0.60**	**50.00**	**N/A**	**N/A**	**N/A**
SW3	**Maximum**	**8.0**	**7530.00**	**5560.00**	**32.00**	**10.40**	**1000.00**	**N/A**	**N/A**	**N/A**
SW3	**Standard deviation**	**0.2**	**1536.80**	**1034.21**	**9.75**	**3.89**	**292.19**	**N/A**	**N/A**	**N/A**
SW4	11/01/11	8.2	7050	4100	86	1.6	204	<0.05	0.04	<5
SW4	9/02/11	8.5	7800	4840	<5	0.9	203	<0.05	<0.01	<10
SW4	15/03/11	8.6	8600	5050	<5	2.1	210	<0.05	<0.01	<5
SW4	18/04/11	8.6	10800	6120	23	3.0	320	<0.05	0.32	<5
SW4	10/05/11	8.1	11800	5760	12	1.1	323	<0.05	0.09	<5
SW4	6/06/11	8.2	9990	5230	10	2.1	1500	<0.05	0.01	6
SW4	12/07/11	8.1	7540	4220	<5	0.1	268	0.06	<0.01	<5
SW4	15/08/11	8.1	8370	4960	<5	1.2	259	<0.05	0.02	<5
SW4	6/09/11	8.2	8650	4600	<5	0.9	266	<0.05	<0.01	<5
SW4	19/10/11	8.2	7780	4460	6	2.1	222	<0.05	0.12	<5
SW4	22/11/11	8.3	7820	4620	10	3.5	240	0.08	0.06	<5
SW4	13/12/11	8.2	7010	4040	8	2.2	62	0.08	<0.01	<5
SW4	**Mean**	**8.3**	**8600.83**	**4833.33**	**22.14**	**1.73**	**339.75**	**N/A**	**N/A**	**N/A**
SW4	**Minimum**	**8.1**	**7010.00**	**4040.00**	**6.00**	**0.10**	**62.00**	**N/A**	**N/A**	**N/A**
SW4	**Maximum**	**8.6**	**11800.00**	**6120.00**	**86.00**	**3.50**	**1500.00**	**N/A**	**N/A**	**N/A**
SW4	**Standard deviation**	**0.2**	**1508.84**	**640.83**	**28.68**	**0.96**	**371.59**	**N/A**	**N/A**	**N/A**

Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW5	11/01/11	8.2	4600	3640	24	1.2	1340	<0.05	<0.01	<5
SW5	9/02/11	8.0	5120	4170	56	3.1	1910	<0.05	<0.01	<10
SW5	15/03/11	8.5	4100	2920	8	1.9	1330	<0.05	0.05	<5
SW5	18/04/11	8.0	4020	2930	14	2.9	1200	0.10	0.13	<5
SW5	10/05/11	7.6	5160	3490	38	6.1	1470	<0.05	<0.1	<5
SW5	6/06/11	7.6	3380	2130	17	16.1	874	<0.05	0.55	6
SW5	12/07/11	8.1	3820	2660	46	8.9	1230	0.05	0.10	<5
SW5	15/08/11	7.9	4600	3360	8	6.6	1330	0.07	0.03	<5
SW5	6/09/11	8.1	5080	3540	22	4.9	1580	<0.05	0.13	<5
SW5	19/10/11	8.1	4400	3080	24	7.9	982	<0.05	0.35	<5
SW5	22/11/11	8.0	3850	2790	8	6.7	1310	<0.05	2.40	<5
SW5	13/12/11	8.1	4040	3180	7	3.7	1580	0.09	0.24	<5
SW5	**Mean**	**8.0**	**4347.50**	**3157.50**	**22.67**	**5.83**	**1344.67**	**N/A**	**N/A**	**N/A**
SW5	**Minimum**	**7.6**	**3380.00**	**2130.00**	**7.00**	**1.20**	**874.00**	**N/A**	**N/A**	**N/A**
SW5	**Maximum**	**8.5**	**5160.00**	**4170.00**	**56.00**	**16.10**	**1910.00**	**N/A**	**N/A**	**N/A**
SW5	**Standard deviation**	**0.2**	**575.93**	**531.62**	**16.22**	**4.03**	**275.49**	**N/A**	**N/A**	**N/A**
SW7	11/01/11	9.0	2970	2190	31	20.6	854	<0.05	0.11	<5
SW7	9/02/11	8.8	2660	1930	10	2.7	783	<0.05	0.09	<10
SW7	15/03/11	9.0	2080	1570	15	8.0	677	<0.05	<0.01	<5
SW7	18/04/11	8.3	3090	2250	20	18.4	1110	<0.05	0.16	<5
SW7	10/05/11	8.8	2600	1760	22	9.7	858	<0.05	0.02	<5
SW7	6/06/11	8.3	2850	1910	13	4.9	853	<0.05	0.61	<5
SW7	12/07/11	8.1	2720	1860	6	3.3	861	0.10	1.54	<5
SW7	15/08/11	8.7	2940	2130	10	4.3	817	0.07	1.17	<5
SW7	6/09/11	8.1	3140	2130	8	1.6	944	<0.05	1.76	<5
SW7	19/10/11	8.4	3260	2150	6	2.1	787	<0.05	2.39	<5
SW7	22/11/11	8.5	3150	2240	<5	1.5	936	<0.05	1.43	<5
SW7	13/12/11	8.3	2800	2000	9	2.1	824	0.08	1.31	<5
SW7	**Mean**	**8.5**	**2855.00**	**2010.00**	**13.64**	**6.60**	**858.67**	**N/A**	**N/A**	**N/A**
SW7	**Minimum**	**8.1**	**2080.00**	**1570.00**	**6.00**	**1.50**	**677.00**	**N/A**	**N/A**	**N/A**
SW7	**Maximum**	**9.0**	**3260.00**	**2250.00**	**31.00**	**20.60**	**1110.00**	**N/A**	**N/A**	**N/A**
SW7	**Standard deviation**	**0.3**	**320.92**	**210.28**	**7.81**	**6.55**	**105.87**	**N/A**	**N/A**	**N/A**
SW9	11/01/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	15/03/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	6/06/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	12/07/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	15/08/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	6/09/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	19/10/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	22/11/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW9	13/12/11	7.91	3540	2460	<5	0.9	760	0.07	<0.01	<5
SW9	**Mean**	**7.9**	**3540.0**	**2460.0**	**N/A**	**0.90**	**760.00**	**N/A**	**N/A**	**N/A**
SW9	**Minimum**	**7.9**	**3540.0**	**2460.0**	**0.00**	**0.90**	**760.00**	**N/A**	**N/A**	**N/A**
SW9	**Maximum**	**7.9**	**3540.0**	**2460.0**	**0.00**	**0.90**	**760.00**	**N/A**	**N/A**	**N/A**
SW9	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SW10	11/01/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	15/03/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	6/06/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	12/07/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	15/08/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	6/09/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	19/10/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	22/11/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW10	13/12/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

Appendix 7 – Water Quality Monitoring Results continued

Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW12	11/01/11	8.0	4410	3370	116	8.7	957	<0.05	<0.01	<5
SW12	9/02/11	7.9	5060	3440	44	1.0	1100	<0.05	<0.01	<10
SW12	15/03/11	8.0	5150	3610	154	1.7	1230	<0.05	<0.01	<5
SW12	18/04/11	7.9	5930	3910	10	1.0	1400	<0.05	0.04	<5
SW12	10/05/11	7.7	5690	3530	<5	0.7	1210	<0.05	0.01	<5
SW12	6/06/11	7.8	5220	3300	13	1.2	919	<0.05	0.01	<5
SW12	12/07/11	7.9	6130	4130	8	0.7	1290	0.08	<0.01	<5
SW12	15/08/11	7.9	6060	4080	26	0.6	1170	<0.05	0.14	<5
SW12	6/09/11	8.1	6190	3830	37	0.8	1160	<0.05	<0.01	<5
SW12	19/10/11	7.9	3940	2650	38	5.3	518	<0.05	<0.01	<5
SW12	22/11/11	8.1	4710	3130	54	4.3	876	<0.05	0.06	<5
SW12	13/12/11	8.0	4670	3160	28	1.2	808	0.06	0.01	<5
SW12	**Mean**	**7.9**	**5263.33**	**3511.67**	**48.00**	**2.27**	**1053.17**	**N/A**	**N/A**	**N/A**
SW12	**Minimum**	**7.7**	**3940.00**	**2650.00**	**8.00**	**0.60**	**518.00**	**N/A**	**N/A**	**N/A**
SW12	**Maximum**	**8.1**	**6190.00**	**4130.00**	**154.00**	**8.70**	**1400.00**	**N/A**	**N/A**	**N/A**
SW12	**Standard deviation**	**0.1**	**742.52**	**432.45**	**46.14**	**2.53**	**245.81**	**N/A**	**N/A**	**N/A**
SW13	11/01/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	15/03/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	6/06/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	12/07/11	6.6	213	169	<5	6.2	23	0.25	<0.01	<5
SW13	15/08/11	7.4	252	298	11	33.9	13	1.55	0.03	<5
SW13	6/09/11	8.0	302	204	16	14.1	<1	3.62	<0.01	<5
SW13	19/10/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	22/11/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW13	13/12/11	7.3	228	236	12	19.3	<1	3.85	0.03	<5
SW13	**Mean**	**7.3**	**248.75**	**226.75**	**13.00**	**18.38**	**18.00**	**N/A**	**N/A**	**N/A**
SW13	**Minimum**	**6.6**	**213.00**	**169.00**	**11.00**	**6.20**	**13.00**	**N/A**	**N/A**	**N/A**
SW13	**Maximum**	**8.0**	**302.00**	**298.00**	**16.00**	**33.90**	**23.00**	**N/A**	**N/A**	**N/A**
SW13	**Standard deviation**	**0.5**	**38.96**	**54.82**	**2.65**	**11.67**	**7.07**	**N/A**	**N/A**	**N/A**
SW14	11/01/11	8.07	577	416	266	551.0	38	<0.05	0.43	<5
SW14	9/02/11	8.5	632	588	116	266.0	56	<0.05	<0.01	<10
SW14	15/03/11	8.4	685	550	56	173.0	69	<0.05	0.01	<5
SW14	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW14	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW14	6/06/11	7.5	235	1150	193	1870.0	33	0.20	1.01	<5
SW14	12/07/11	6.8	221	481	156	938.0	21	0.16	1.01	<5
SW14	15/08/11	7.8	244	882	97	952.0	28	0.06	0.92	<5
SW14	6/09/11	8.6	3380	2110	233	68.8	836	0.06	<0.01	8
SW14	19/10/11	8.1	240	1170	384	1340.0	19	0.13	1.30	<5
SW14	22/11/11	8.2	358	592	229	562.0	27	<0.05	0.73	<5
SW14	13/12/11	7.9	232	643	<5	640.0	19	0.21	0.17	<5
SW14	**Mean**	**8.0**	**680.40**	**858.20**	**192.22**	**736.08**	**114.60**	**N/A**	**N/A**	**N/A**
SW14	**Minimum**	**6.8**	**221.00**	**416.00**	**56.00**	**68.80**	**19.00**	**N/A**	**N/A**	**N/A**
SW14	**Maximum**	**8.6**	**3380.00**	**2110.00**	**384.00**	**1870.00**	**836.00**	**N/A**	**N/A**	**N/A**
SW14	**Standard deviation**	**0.5**	**966.08**	**513.48**	**99.99**	**557.27**	**254.01**	**N/A**	**N/A**	**N/A**
SW15	11/01/11	8.9	3430	2870	<5	2.8	1030	<0.05	<0.01	<5
SW15	9/02/11	9.1	3890	2550	11	3.7	953	<0.05	0.02	<10
SW15	15/03/11	8.4	4530	3040	9	2.2	1160	<0.05	0.02	<5
SW15	18/04/11	9.1	5440	3440	37	5.4	1220	<0.05	0.04	<5
SW15	10/05/11	8.7	6030	3500	28	4.7	1310	<0.05	0.01	<5
SW15	6/06/11	8.1	3610	2330	7	4.1	867	<0.05	0.02	5
SW15	12/07/11	8.2	3260	2070	<5	2.8	888	0.05	0.03	<5
SW15	15/08/11	9.1	3690	2500	<5	2.6	912	<0.05	0.02	<5
SW15	6/09/11	8.0	232	834	380	1110.0	25	<0.05	1.45	<5
SW15	19/10/11	8.8	2860	1960	12	2.8	504	<0.05	<0.01	<5
SW15	22/11/11	8.8	2630	1760	6	0.7	700	<0.05	0.06	<5
SW15	13/12/11	8.7	2780	1890	40	11.0	716	0.08	<0.01	<5
SW15	**Mean**	**8.6**	**3531.83**	**2395.33**	**58.89**	**96.07**	**857.08**	**N/A**	**N/A**	**N/A**
SW15	**Minimum**	**8.0**	**232.00**	**834.00**	**6.00**	**0.70**	**25.00**	**N/A**	**N/A**	**N/A**
SW15	**Maximum**	**9.1**	**6030.00**	**3500.00**	**380.00**	**1110.00**	**1310.00**	**N/A**	**N/A**	**N/A**
SW15	**Standard deviation**	**0.4**	**1472.19**	**761.80**	**121.13**	**319.32**	**348.16**	**N/A**	**N/A**	**N/A**

Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW16	11/01/11	8.5	792	460	58	38.3	79	<0.05	<0.01	<5
SW16	9/02/11	8.3	633	452	48	14.1	65	<0.05	<0.01	<10
SW16	15/03/11	8.6	577	392	12	5.4	48	<0.05	<0.01	<5
SW16	18/04/11	8.3	617	354	14	10.0	44	<0.05	0.07	<5
SW16	10/05/11	8.4	607	300	36	19.7	38	<0.05	0.02	<5
SW16	6/06/11	8.6	646	290	8	8.9	46	<0.05	0.10	6
SW16	12/07/11	8.5	929	444	12	8.2	152	<0.05	0.63	<5
SW16	15/08/11	8.5	1250	738	7	6.8	224	<0.05	0.96	<5
SW16	6/09/11	8.4	1550	872	12	7.8	300	<0.05	1.03	<5
SW16	19/10/11	8.7	1810	1170	14	8.1	324	<0.05	1.89	<5
SW16	22/11/11	8.5	2650	1660	34	17.0	504	<0.05	2.88	<5
SW16	13/12/11	8.5	2520	1640	16	6.1	481	0.08	2.94	<5
SW16	**Mean**	**8.5**	**1215.08**	**731.00**	**22.58**	**12.53**	**192.08**	**N/A**	**N/A**	**N/A**
SW16	**Minimum**	**8.3**	**577.00**	**290.00**	**7.00**	**5.40**	**38.00**	**N/A**	**N/A**	**N/A**
SW16	**Maximum**	**8.7**	**2650.00**	**1660.00**	**58.00**	**38.30**	**504.00**	**N/A**	**N/A**	**N/A**
SW16	**Standard deviation**	**0.1**	**756.02**	**502.08**	**17.04**	**9.26**	**172.98**	**N/A**	**N/A**	**N/A**
SW17	11/01/11	8.3	3530	2970	28	11.4	1040	<0.05	0.24	<5
SW17	9/02/11	8.3	4420	3620	17	4.2	1810	<0.05	0.14	<10
SW17	15/03/11	8.4	5510	4650	21	3.0	2380	<0.05	0.40	<5
SW17	18/04/11	8.4	6660	5390	18	3.3	2950	<0.50	0.71	<5
SW17	10/05/11	8.4	3920	2980	8	4.1	1490	<0.05	0.21	<5
SW17	6/06/11	8.5	3360	2360	16	7.8	1100	<0.05	0.56	6
SW17	12/07/11	8.5	3280	2440	16	5.6	1310	0.08	0.48	<5
SW17	15/08/11	8.5	3950	3170	8	3.2	1520	<0.05	0.84	<5
SW17	6/09/11	8.4	4730	3550	70	39.0	1890	<0.05	0.56	<5
SW17	19/10/11	8.5	5060	3860	32	14.9	1700	<0.05	1.01	<5
SW17	22/11/11	8.2	2970	2180	38	39.4	953	<0.05	0.93	<5
SW17	13/12/11	8.5	3580	2870	14	3.0	1420	0.10	0.26	<5
SW17	**Mean**	**8.4**	**4247.50**	**3336.67**	**23.83**	**11.58**	**1630.25**	**N/A**	**N/A**	**N/A**
SW17	**Minimum**	**8.2**	**2970.00**	**2180.00**	**8.00**	**3.00**	**953.00**	**N/A**	**N/A**	**N/A**
SW17	**Maximum**	**8.5**	**6660.00**	**5390.00**	**70.00**	**39.40**	**2950.00**	**N/A**	**N/A**	**N/A**
SW17	**Standard deviation**	**0.1**	**1080.77**	**950.77**	**17.12**	**13.43**	**578.03**	**N/A**	**N/A**	**N/A**
SW18	11/01/11	8.5	3440	2810	<5	1.0	985	<0.05	<0.01	<5
SW18	9/02/11	9.0	3730	2620	14	1.5	1090	<0.05	0.02	<10
SW18	15/03/11	8.8	3910	2700	<5	1.7	1150	<0.05	<0.01	<5
SW18	18/04/11	8.2	3760	2600	12	3.9	1120	<0.05	0.30	<5
SW18	10/05/11	8.8	3970	2630	6	0.9	1090	<0.05	<0.01	<5
SW18	6/06/11	7.6	2690	1720	9	6.8	728	<0.05	0.79	6
SW18	12/07/11	8.2	2070	1220	6	7.4	596	0.08	0.33	<5
SW18	15/08/11	8.2	3070	1380	5	2.7	822	<0.05	0.11	<5
SW18	6/09/11	8.0	4270	2830	16	6.4	1270	<0.05	0.41	<5
SW18	19/10/11	8.6	3350	2540	15	8.2	868	<0.05	0.75	<5
SW18	22/11/11	8.4	3200	2210	8	3.7	948	<0.05	1.07	<5
SW18	13/12/11	8.4	3470	2580	6	3.3	1030	0.09	0.04	<5
SW18	**Mean**	**8.4**	**3410.83**	**2320.00**	**9.70**	**3.96**	**974.75**	**N/A**	**N/A**	**N/A**
SW18	**Minimum**	**7.6**	**2070.00**	**1220.00**	**5.00**	**0.90**	**596.00**	**N/A**	**N/A**	**N/A**
SW18	**Maximum**	**9.0**	**4270.00**	**2830.00**	**16.00**	**8.20**	**1270.00**	**N/A**	**N/A**	**N/A**
SW18	**Standard deviation**	**0.4**	**603.77**	**563.33**	**4.19**	**2.61**	**192.70**	**N/A**	**N/A**	**N/A**
SW21-UG	11/01/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	15/03/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	6/06/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	12/07/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	15/08/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	6/09/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	19/10/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	22/11/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW21-UG	13/12/11	8.5	5910	3290	13	2.9	107	0.10	<0.01	<5
SW21-UG	**Mean**	**8.5**	**5910.00**	**3290.00**	**13.00**	**2.90**	**N/A**	**N/A**	**N/A**	**N/A**
SW21-UG	**Minimum**	**8.5**	**5910.00**	**3290.00**	**13.00**	**2.90**	**N/A**	**N/A**	**N/A**	**N/A**
SW21-UG	**Maximum**	**8.5**	**5910.00**	**3290.00**	**13.00**	**2.90**	**N/A**	**N/A**	**N/A**	**N/A**
SW21-UG	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

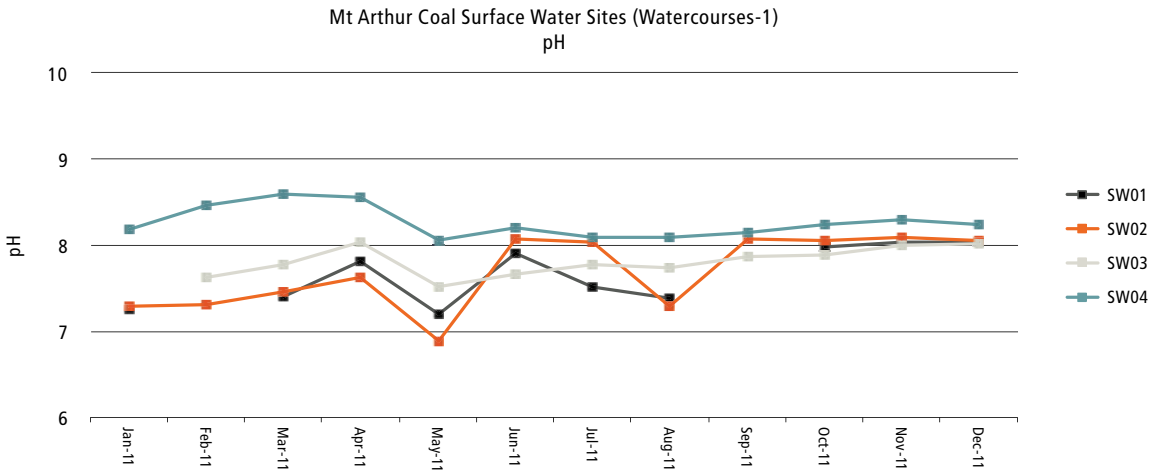
Appendix 7 – Water Quality Monitoring Results continued

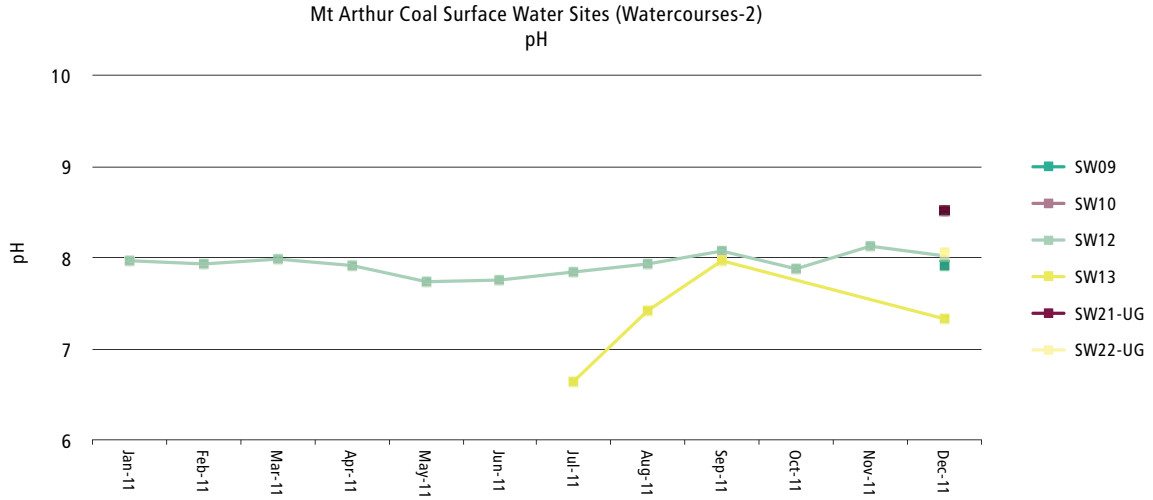
Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW22-UG	11/01/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	9/02/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	15/03/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	18/04/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	10/05/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	6/06/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	12/07/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	15/08/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	6/09/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	19/10/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	22/11/11	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
SW22-UG	13/12/11	8.1	378	404	90	258.0	4	0.22	<0.01	<5
SW22-UG	**Mean**	**8.1**	**378.00**	**404.00**	**90.00**	**258.00**	**N/A**	**N/A**	**N/A**	**N/A**
SW22-UG	**Minimum**	**8.1**	**378.00**	**404.00**	**90.00**	**258.00**	**N/A**	**N/A**	**N/A**	**N/A**
SW22-UG	**Maximum**	**8.1**	**378.00**	**404.00**	**90.00**	**258.00**	**N/A**	**N/A**	**N/A**	**N/A**
SW22-UG	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SW23	11/01/11	8.4	3590	3140	22	8.0	1290	<0.05	<0.01	<5
SW23	9/02/11	8.5	3520	2720	41	4.8	1260	<0.05	0.11	<10
SW23	15/03/11	8.6	2730	2010	20	9.0	1020	<0.05	0.08	<5
SW23	18/04/11	8.3	3250	2430	12	16.3	1270	<0.05	0.70	<5
SW23	10/05/11	8.4	5020	3920	14	4.3	2200	<0.05	<0.01	<5
SW23	6/06/11	8.2	3600	2850	29	14.1	1660	<0.05	0.61	<5
SW23	12/07/11	8.4	5710	5090	12	5.6	3190	0.08	2.43	<5
SW23	15/08/11	9.2	2910	2100	14	6.5	946	<0.05	1.60	<5
SW23	6/09/11	8.3	5570	4580	24	8.7	262	<0.05	0.15	<5
SW23	19/10/11	8.4	4340	3840	22	10.7	1810	<0.05	1.08	<5
SW23	22/11/11	8.3	3350	2660	20	16.1	1610	<0.05	0.78	<5
SW23	13/12/11	8.2	4250	3760	10	5.0	1940	0.10	0.91	<5
SW23	**Mean**	**8.4**	**3986.67**	**3258.33**	**20.00**	**9.09**	**1538.17**	**N/A**	**N/A**	**N/A**
SW23	**Minimum**	**8.2**	**2730.00**	**2010.00**	**10.00**	**4.30**	**262.00**	**N/A**	**N/A**	**N/A**
SW23	**Maximum**	**9.2**	**5710.00**	**5090.00**	**41.00**	**16.30**	**3190.00**	**N/A**	**N/A**	**N/A**
SW23	**Standard deviation**	**0.3**	**997.72**	**979.07**	**8.77**	**4.34**	**731.16**	**N/A**	**N/A**	**N/A**
SW24	11/01/11	8.3	3670	2390	8	1.1	606	<0.05	25.70	<5
SW24	9/02/11	8.4	4380	2790	9	3.1	603	<0.05	40.30	<5
SW24	15/03/11	8.8	3770	2150	16	3.7	555	<0.05	2.74	<5
SW24	18/04/11	8.6	3320	2120	5	3.2	418	<0.05	0.64	<5
SW24	10/05/11	9.1	4220	2320	24	8.5	658	<0.05	3.09	<5
SW24	6/06/11	9.2	3130	1730	20	8.0	437	<0.05	1.76	<5
SW24	12/07/11	8.3	6430	5280	28	8.4	3150	0.08	13.80	<5
SW24	15/08/11	8.7	4470	2920	10	2.5	704	0.06	65.20	<5
SW24	6/09/11	8.7	2660	1440	10	5.8	349	<0.05	2.56	<5
SW24	19/10/11	8.9	3350	2210	10	9.4	398	<0.05	21.10	<5
SW24	22/11/11	8.9	3310	1950	14	8.9	378	<0.05	17.60	<5
SW24	13/12/11	9.1	1730	1090	5	5.6	232	0.06	16.20	<5
SW24	**Mean**	**8.8**	**3703.33**	**2365.83**	**13.25**	**5.68**	**707.33**	**N/A**	**N/A**	**N/A**
SW24	**Minimum**	**8.3**	**1730.00**	**1090.00**	**5.00**	**1.10**	**232.00**	**N/A**	**N/A**	**N/A**
SW24	**Maximum**	**9.2**	**6430.00**	**5280.00**	**28.00**	**9.40**	**3150.00**	**N/A**	**N/A**	**N/A**
SW24	**Standard deviation**	**0.3**	**1147.75**	**1052.08**	**7.39**	**2.90**	**782.11**	**N/A**	**N/A**	**N/A**
SW25	11/01/11	8.9	2610	1480	13	4.8	202	<0.05	0.09	<5
SW25	9/02/11	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled
SW25	15/03/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	18/04/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	10/05/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	6/06/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	12/07/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	15/08/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	6/09/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	19/10/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	22/11/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	13/12/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW25	**Mean**	**8.9**	**2610.00**	**1480.00**	**13.00**	**4.80**	**202.00**	**N/A**	**N/A**	**N/A**
SW25	**Minimum**	**8.9**	**2610.00**	**1480.00**	**13.00**	**4.80**	**202.00**	**N/A**	**N/A**	**N/A**
SW25	**Maximum**	**8.9**	**2610.00**	**1480.00**	**13.00**	**4.80**	**202.00**	**N/A**	**N/A**	**N/A**
SW25	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

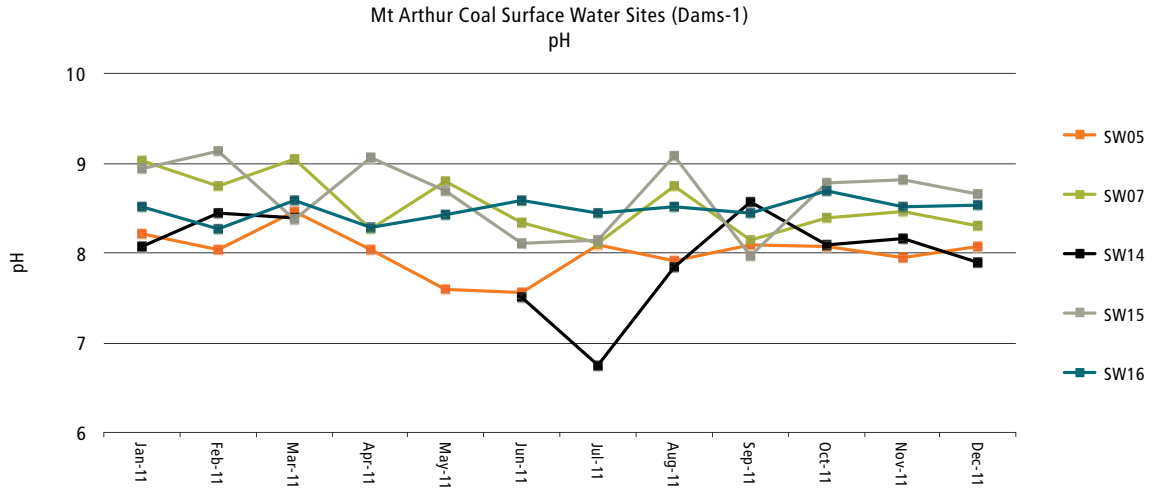
Site	Date	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Sulfate (mg/L)	Filterable iron (mg/L)	Nitrate (mg/L)	O&G (mg/L)
SW26	11/01/11	8.5	4290	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled	Not sampled
SW26	9/02/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	15/03/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	18/04/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	10/05/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	6/06/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	12/07/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	15/08/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	6/09/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	19/10/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	22/11/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	13/12/11	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed	Removed
SW26	**Mean**	**8.5**	**4290.00**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SW26	**Minimum**	**8.5**	**4290.00**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SW26	**Maximum**	**8.5**	**4290.00**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SW26	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

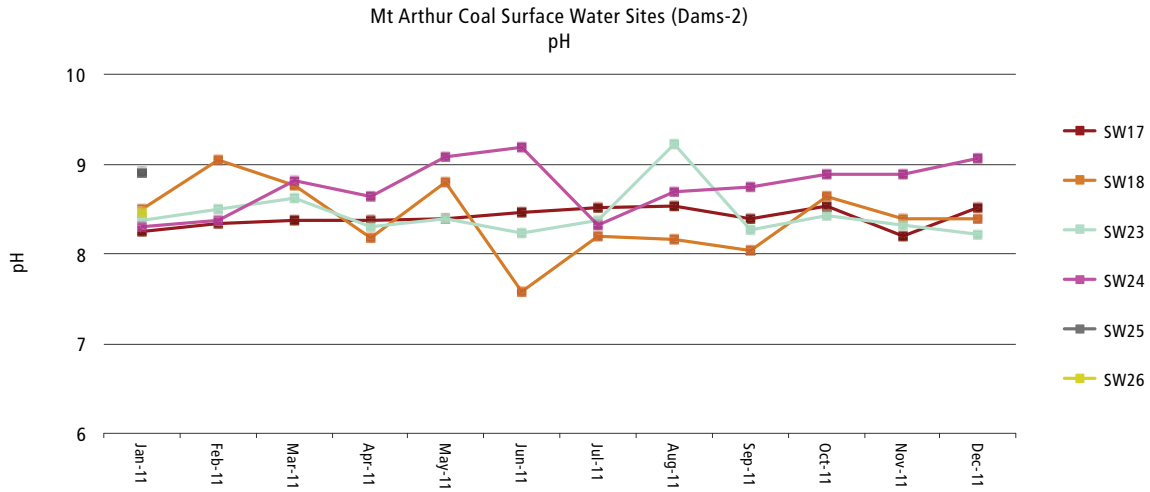
Appendix 7 – Water Quality Monitoring Results continued

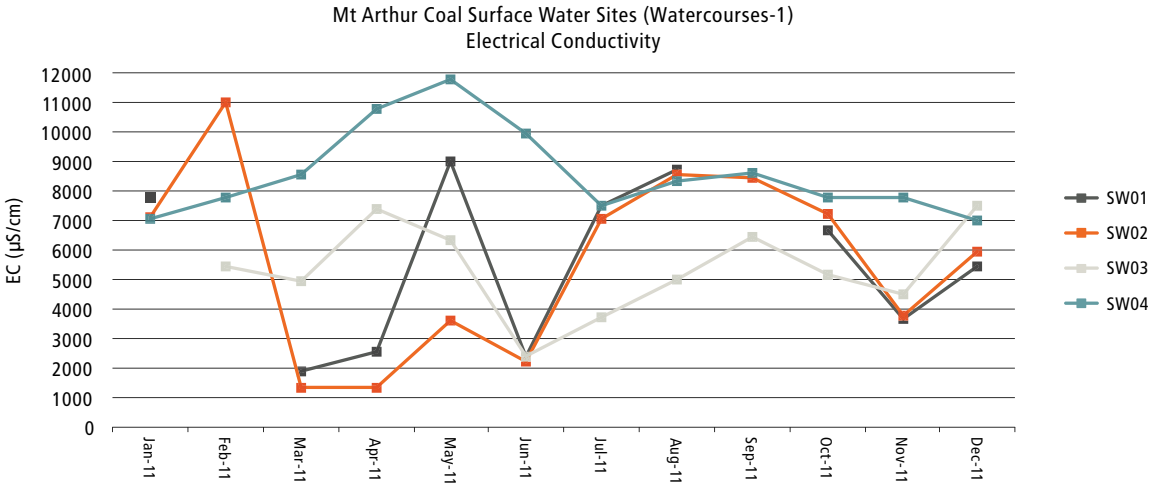
Surface Water Graphs

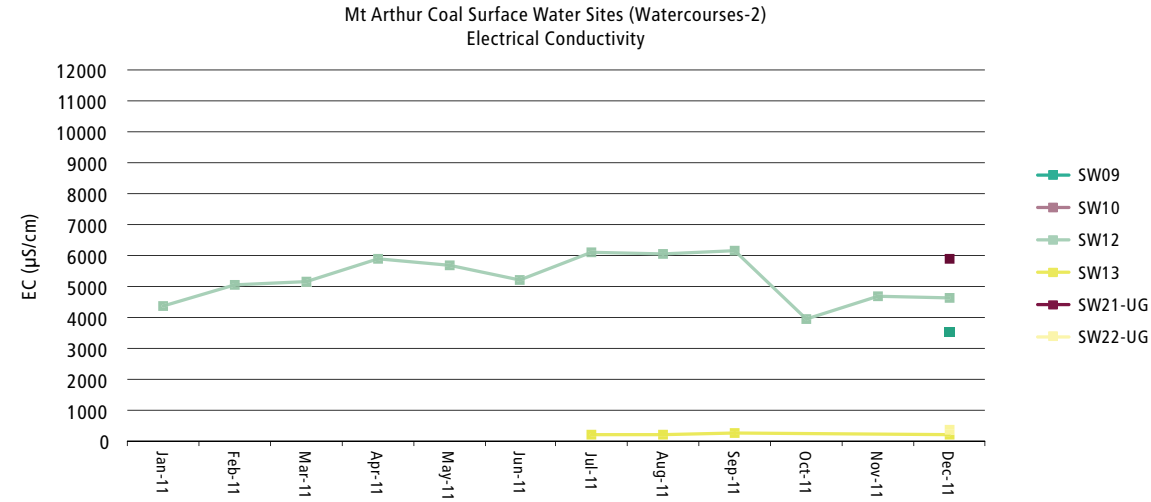


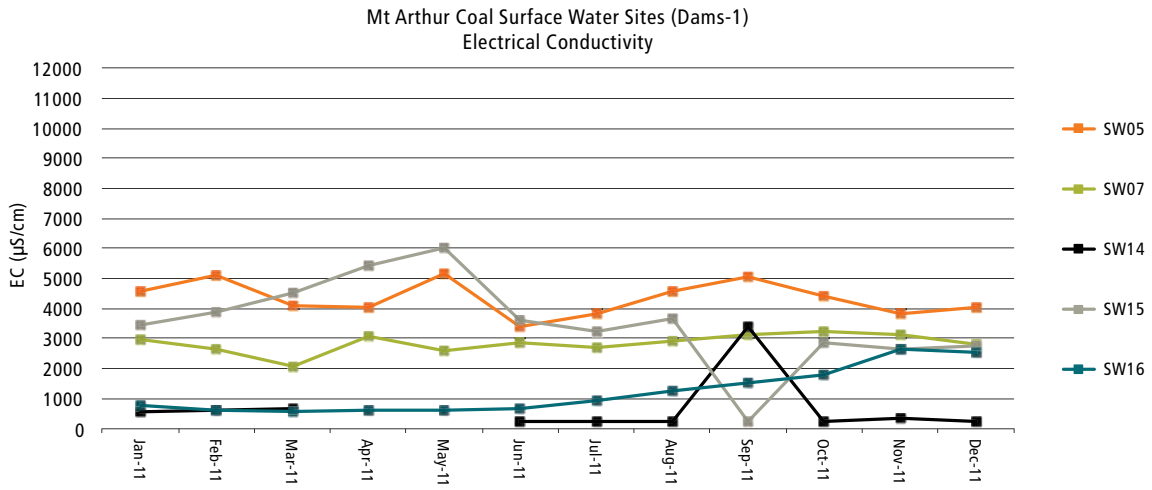


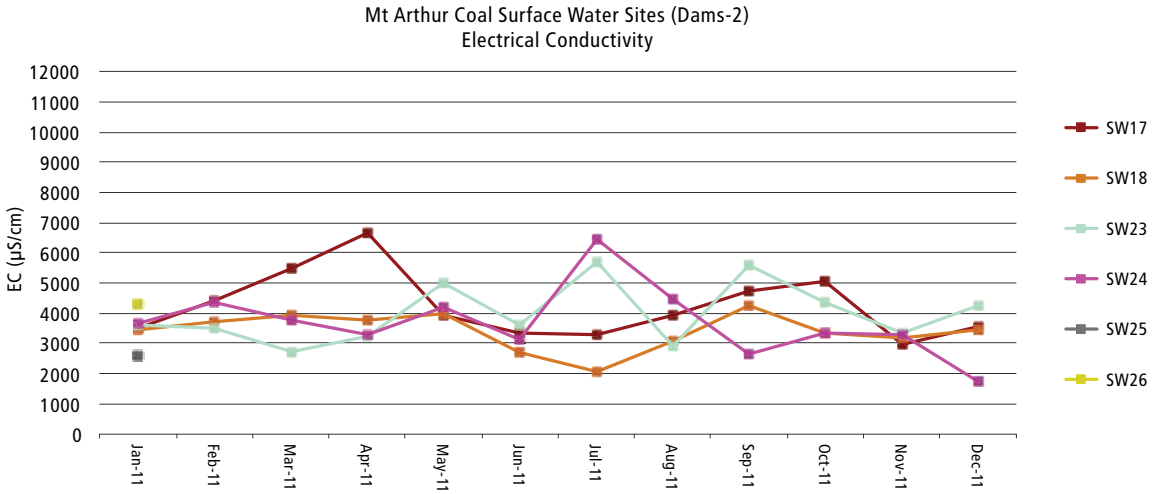


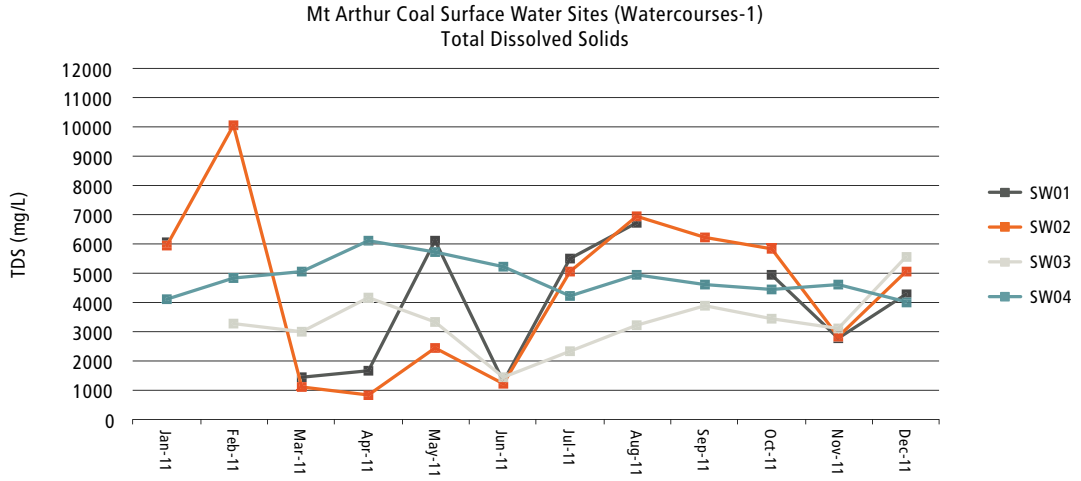

Mt Arthur Coal Surface Water Sites (Dams-2)
pH
10
9
8
7
6
pH
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW17
SW18
SW23
SW24
SW25
SW26

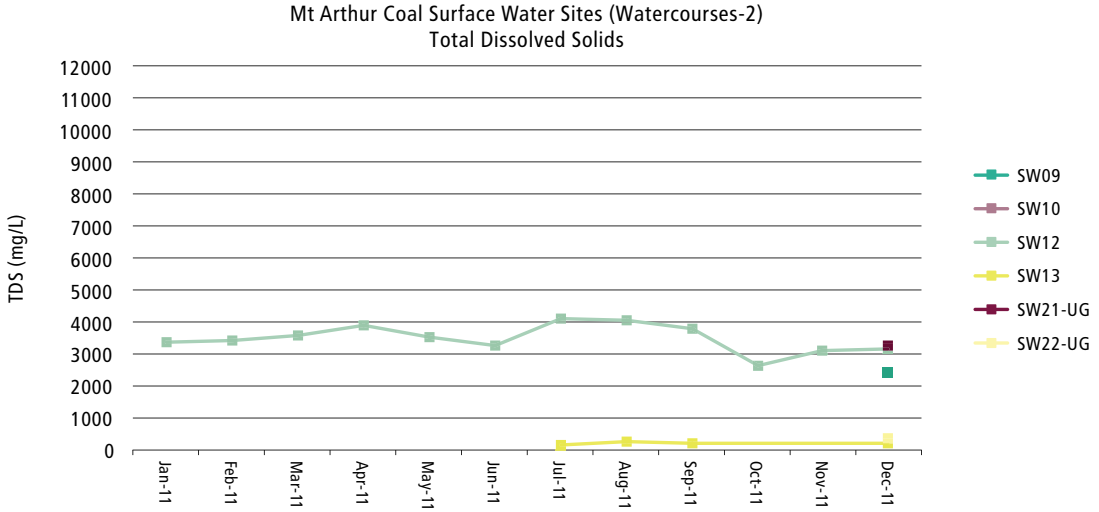

Mt Arthur Coal Surface Water Sites (Watercourses-1)
Electrical Conductivity
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
EC (µS/cm)
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW01
SW02
SW03
SW04

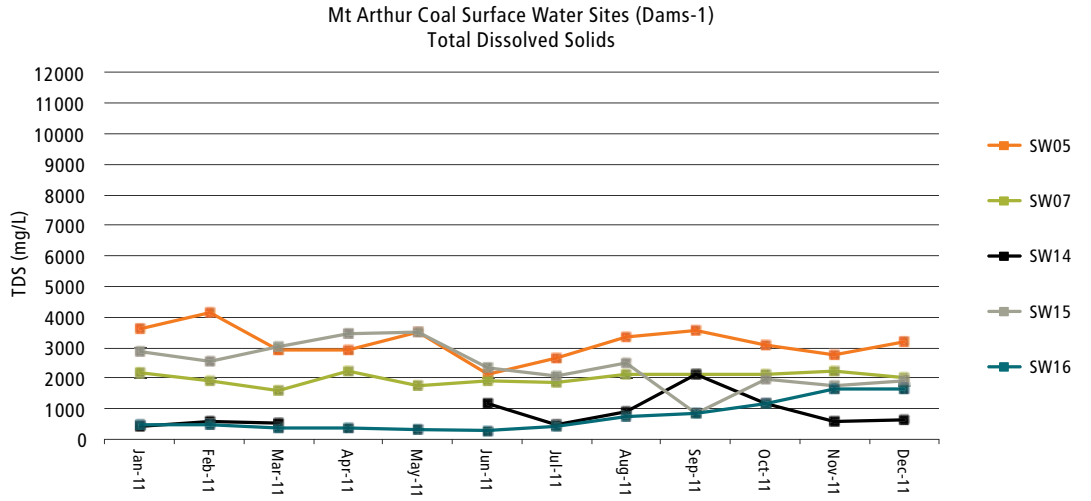

Mt Arthur Coal Surface Water Sites (Watercourses-2)
Electrical Conductivity
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
EC (µS/cm)
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW09
SW10
SW12
SW13
SW21-UG
SW22-UG

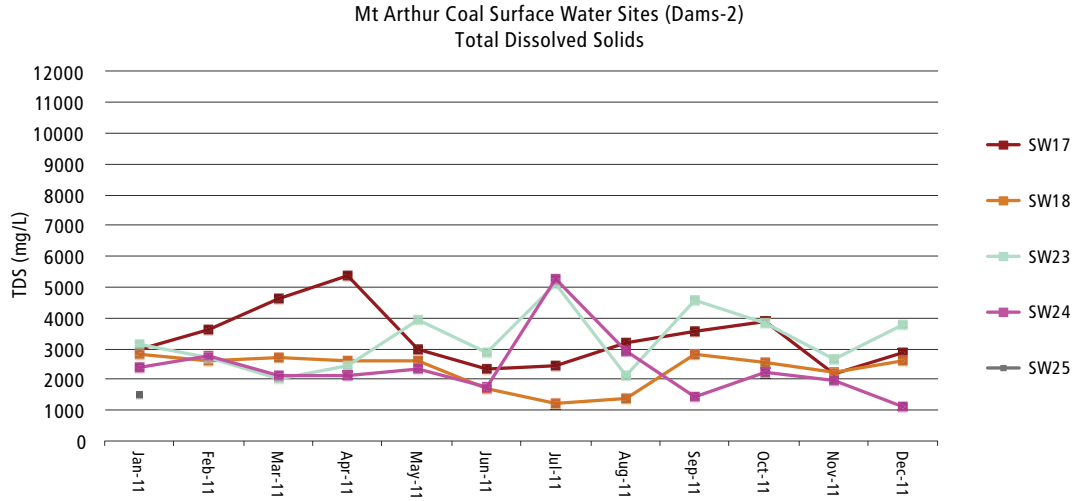

Mt Arthur Coal Surface Water Sites (Dams-1)
Electrical Conductivity
EC (µS/cm)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW05
SW07
SW14
SW15
SW16

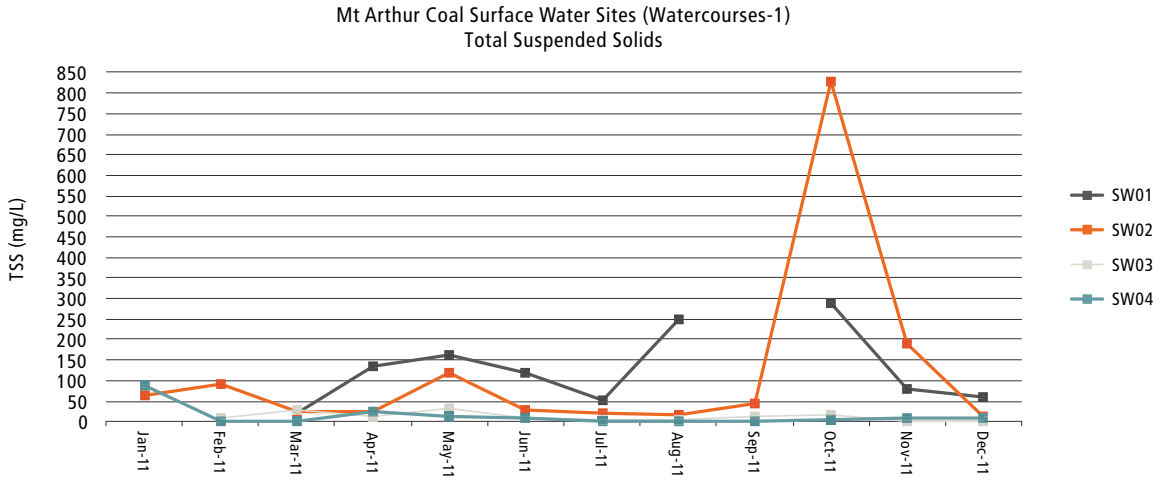

Mt Arthur Coal Surface Water Sites (Dams-2)
Electrical Conductivity
EC (µS/cm)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW17
SW18
SW23
SW24
SW25
SW26

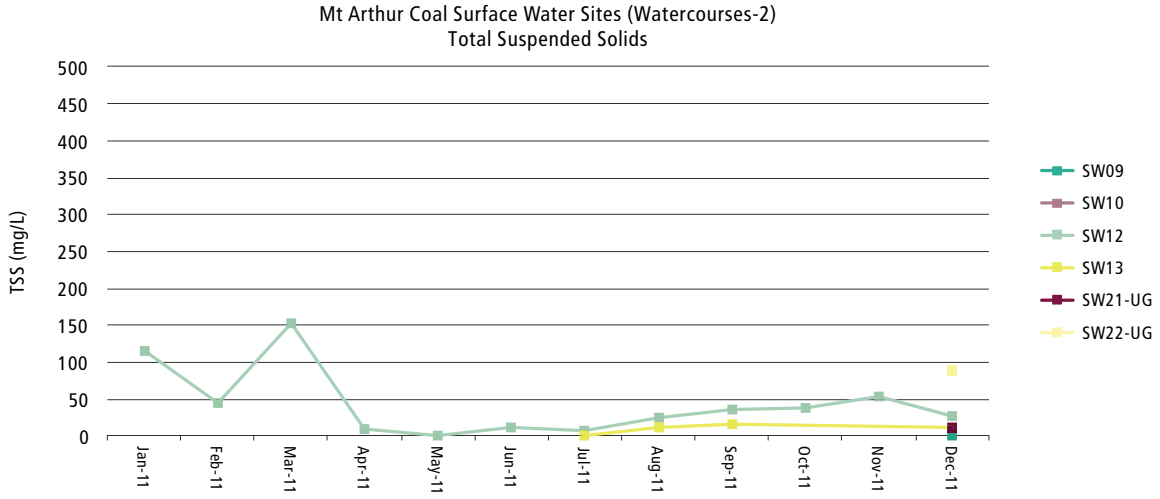

Mt Arthur Coal Surface Water Sites (Watercourses-1)
Total Dissolved Solids
TDS (mg/L)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW01
SW02
SW03
SW04

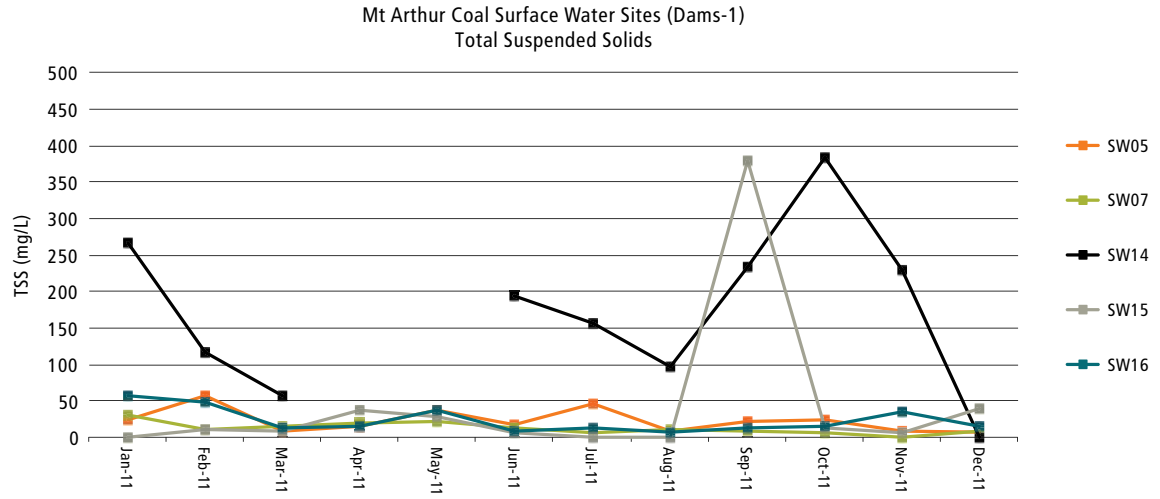

Mt Arthur Coal Surface Water Sites (Watercourses-2)
Total Dissolved Solids
TDS (mg/L)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW09
SW10
SW12
SW13
SW21-UG
SW22-UG

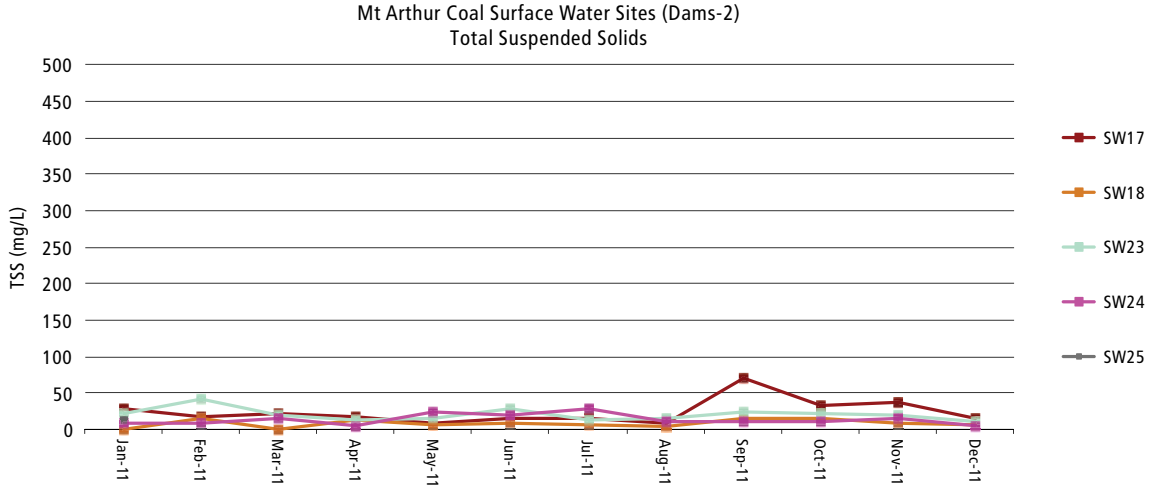

Mt Arthur Coal Surface Water Sites (Dams-1)
Total Dissolved Solids
TDS (mg/L)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW05
SW07
SW14
SW15
SW16


Mt Arthur Coal Surface Water Sites (Dams-2)
Total Dissolved Solids
TDS (mg/L)
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW17
SW18
SW23
SW24
SW25


Mt Arthur Coal Surface Water Sites (Watercourses-1)
Total Suspended Solids
TSS (mg/L)
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW01
SW02
SW03
SW04


Mt Arthur Coal Surface Water Sites (Watercourses-2)
Total Suspended Solids
TSS (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW09
SW10
SW12
SW13
SW21-UG
SW22-UG


Mt Arthur Coal Surface Water Sites (Dams-1)
Total Suspended Solids
TSS (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW05
SW07
SW14
SW15
SW16


Mt Arthur Coal Surface Water Sites (Dams-2)
Total Suspended Solids
TSS (mg/L)
500
450
400
350
300
250
200
150
100
50
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
SW17
SW18
SW23
SW24
SW25

Appendix 7 – Water Quality Monitoring Results continued

Groundwater Monitoring Data

Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
GW2	14/02/11	9.47	8.2	3410	2120	104	<0.05
GW2	12/04/11	9.54	7.4	3450	2290	6	<0.05
GW2	7/07/11	9.34	7.3	3630	2010	5	<0.05
GW2	23/08/11	9.06	7.8	3560	2110	5	<0.05
GW2	17/11/11	8.50	8.0	3510	2130	<5	<0.05
GW2	16/01/12	8.13	7.5	3430	1900	14	<0.05
GW2	**Mean**	**9.01**	**7.69**	**3498.33**	**2093.33**	**26.80**	**N/A**
GW2	**Minimum**	**8.13**	**7.30**	**3410.00**	**1900.00**	**5.00**	**N/A**
GW2	**Maximum**	**9.54**	**8.15**	**3630.00**	**2290.00**	**104.00**	**N/A**
GW2	**Standard deviation**	**0.57**	**0.33**	**84.95**	**130.64**	**43.32**	**N/A**
GW3	14/02/11	6.52	8.2	4140	2500	5	<0.05
GW3	12/04/11	6.78	7.3	4080	2620	6	<0.05
GW3	7/07/11	6.94	7.8	4180	2320	<5	<0.05
GW3	23/08/11	6.69	8.1	4160	2530	6	<0.05
GW3	17/11/11	6.32	8.2	4060	2560	<5	<0.05
GW3	16/01/12	6.10	7.9	4050	2470	11	<0.05
GW3	**Mean**	**6.56**	**7.92**	**4111.67**	**2500.00**	**7.00**	**N/A**
GW3	**Minimum**	**6.10**	**7.30**	**4050.00**	**2320.00**	**5.00**	**N/A**
GW3	**Maximum**	**6.94**	**8.23**	**4180.00**	**2620.00**	**11.00**	**N/A**
GW3	**Standard deviation**	**0.31**	**0.34**	**55.29**	**102.18**	**2.71**	**N/A**
GW6	14/02/11	23.71	7.1	4550	4110	10	<0.05
GW6	12/04/11	23.65	6.4	4480	3190	24	<0.05
GW6	7/07/11	23.56	7.0	4420	3100	11	0.1
GW6	23/08/11	23.70	7.1	4460	3230	12	<0.05
GW6	17/11/11	No access	No access	No access	No access	No access	No access
GW6	16/01/12	23.38	6.9	4030	3190	22	<0.05
GW6	**Mean**	**23.60**	**6.90**	**4388.00**	**3364.00**	**15.80**	**0.10**
GW6	**Minimum**	**23.38**	**6.40**	**4030.00**	**3100.00**	**10.00**	**0.10**
GW6	**Maximum**	**23.71**	**7.11**	**4550.00**	**4110.00**	**24.00**	**0.10**
GW6	**Standard deviation**	**0.14**	**0.29**	**205.60**	**419.74**	**6.65**	**N/A**
GW7	14/02/11	41.01	7.6	4820	2720	62	0.31
GW7	12/04/11	41.02	7.1	4700	2790	58	<0.05
GW7	7/07/11	40.99	7.0	4670	2570	48	0.07
GW7	23/08/11	41.00	7.2	4660	2840	55	<0.05
GW7	17/11/11	40.97	7.3	4500	2830	98	0.14
GW7	16/01/12	40.98	6.7	4140	2790	19	<0.05
GW7	**Mean**	**41.00**	**7.15**	**4581.67**	**2756.67**	**56.67**	**0.17**
GW7	**Minimum**	**40.97**	**6.65**	**4140.00**	**2570.00**	**19.00**	**0.07**
GW7	**Maximum**	**41.02**	**7.61**	**4820.00**	**2840.00**	**98.00**	**0.31**
GW7	**Standard deviation**	**0.02**	**0.32**	**239.37**	**100.73**	**25.44**	**0.12**
GW8	14/02/11	72.37	7.6	5580	3190	290	<0.05
GW8	12/04/11	71.06	7.3	4850	3010	564	<0.05
GW8	7/07/11	71.08	6.9	5350	3030	866	0.07
GW8	23/08/11	78.59	7.1	5310	3370	224	0.05
GW8	17/11/11	Insufficient water	Insufficient water	Insufficient water	Insufficient water	Insufficient water	Insufficient water
GW8	16/01/12	71.42	6.0	3830	2660	122	0.57
GW8	**Mean**	**72.90**	**6.98**	**4984.00**	**3052.00**	**413.20**	**0.23**
GW8	**Minimum**	**71.06**	**5.99**	**3830.00**	**2660.00**	**122.00**	**0.05**
GW8	**Maximum**	**78.59**	**7.60**	**5580.00**	**3370.00**	**866.00**	**0.57**
GW8	**Standard deviation**	**3.22**	**0.61**	**697.34**	**262.72**	**301.47**	**0.29**
GW13	14/02/11	Removed	Removed	Removed	Removed	Removed	Removed
GW13	12/04/11	Removed	Removed	Removed	Removed	Removed	Removed
GW13	7/07/11	Removed	Removed	Removed	Removed	Removed	Removed
GW13	23/08/11	Removed	Removed	Removed	Removed	Removed	Removed
GW13	17/11/11	Removed	Removed	Removed	Removed	Removed	Removed
GW13	16/01/12	Removed	Removed	Removed	Removed	Removed	Removed
GW15	14/02/11	No access	No access	No access	No access	No access	No access
GW15	12/04/11	39.75	6.9	5520	3150	33	<0.05
GW15	7/07/11	Removed	Removed	Removed	Removed	Removed	Removed
GW15	23/08/11	Removed	Removed	Removed	Removed	Removed	Removed
GW15	17/11/11	Removed	Removed	Removed	Removed	Removed	Removed
GW15	16/01/12	Removed	Removed	Removed	Removed	Removed	Removed
GW15	**Mean**	**39.75**	**6.90**	**5520.00**	**3150.00**	**33.00**	**N/A**
GW15	**Minimum**	**39.75**	**6.90**	**5520.00**	**3150.00**	**33.00**	**0.00**
GW15	**Maximum**	**39.75**	**6.90**	**5520.00**	**3150.00**	**33.00**	**N/A**
GW15	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
GW16	14/02/11	9.69	7.6	3590	2360	83	<0.05
GW16	12/04/11	9.60	7.0	3470	2250	12	<0.05
GW16	7/07/11	9.36	7.2	3640	2210	14	<0.05
GW16	23/08/11	9.29	7.4	3570	2380	20	<0.05
GW16	17/11/11	9.45	7.6	3180	2110	36	<0.05
GW16	16/01/12	9.37	7.4	2990	2140	38	<0.05
GW16	**Mean**	**9.46**	**7.36**	**3406.67**	**2241.67**	**33.83**	**N/A**
GW16	**Minimum**	**9.29**	**7.00**	**2990.00**	**2110.00**	**12.00**	**N/A**
GW16	**Maximum**	**9.69**	**7.60**	**3640.00**	**2380.00**	**83.00**	**N/A**
GW16	**Standard deviation**	**0.15**	**0.23**	**262.20**	**111.25**	**26.46**	**N/A**
GW21	14/02/11	9.05	7.8	636	370	176	0.07
GW21	12/04/11	8.96	7.2	900	552	269	0.14
GW21	7/07/11	8.37	7.0	921	428	78	0.34
GW21	23/08/11	8.49	7.2	932	534	95	0.16
GW21	17/11/11	8.56	7.4	855	510	87	0.21
GW21	16/01/12	8.68	7.4	836	518	39	0.18
GW21	**Mean**	**8.69**	**7.34**	**846.67**	**485.33**	**124.00**	**0.18**
GW21	**Minimum**	**8.37**	**7.03**	**636.00**	**370.00**	**39.00**	**0.07**
GW21	**Maximum**	**9.05**	**7.80**	**932.00**	**552.00**	**269.00**	**0.34**
GW21	**Standard deviation**	**0.27**	**0.27**	**109.74**	**70.82**	**84.00**	**0.09**
GW22	14/02/11	36.38	7.2	5800	3520	22	0.55
GW22	12/04/11	37.29	6.4	5740	3340	16	0.77
GW22	7/07/11	36.69	6.8	5870	2890	18	0.43
GW22	23/08/11	36.51	7.0	5780	3580	16	0.4
GW22	17/11/11	36.41	7.2	5660	3720	18	0.36
GW22	16/01/12	36.56	7.0	5120	3470	20	0.32
GW22	**Mean**	**36.64**	**6.93**	**5661.67**	**3420.00**	**18.33**	**0.47**
GW22	**Minimum**	**36.38**	**6.40**	**5120.00**	**2890.00**	**16.00**	**0.32**
GW22	**Maximum**	**37.29**	**7.20**	**5870.00**	**3720.00**	**22.00**	**0.77**
GW22	**Standard deviation**	**0.34**	**0.29**	**274.26**	**288.24**	**2.34**	**0.17**
GW23	14/02/11	51.26	7.2	4450	2720	18	3.13
GW23	12/04/11	51.46	6.3	4280	2570	22	3.03
GW23	7/07/11	57.10	6.9	4330	2430	30	4.14
GW23	23/08/11	51.49	7.1	4310	2660	39	3.23
GW23	17/11/11	51.26	7.2	4160	2700	44	2.88
GW23	16/01/12	51.38	7.1	3960	2550	32	3.36
GW23	**Mean**	**52.33**	**6.94**	**4248.33**	**2605.00**	**30.83**	**3.30**
GW23	**Minimum**	**51.26**	**6.26**	**3960.00**	**2430.00**	**18.00**	**2.88**
GW23	**Maximum**	**57.10**	**7.20**	**4450.00**	**2720.00**	**44.00**	**4.14**
GW23	**Standard deviation**	**2.34**	**0.35**	**169.16**	**109.68**	**9.85**	**0.45**
GW25	14/02/11	9.66	7.7	4960	3140	72	<0.05
GW25	12/04/11	9.99	7.2	5150	3170	64	<0.05
GW25	7/07/11	9.56	7.1	6210	3070	104	<0.05
GW25	23/08/11	9.47	7.4	5960	3390	75	0.06
GW25	17/11/11	8.91	7.7	4000	2680	126	<0.05
GW25	16/01/12	8.80	7.4	3810	2610	38	<0.05
GW25	**Mean**	**9.40**	**7.40**	**5015.00**	**3010.00**	**79.83**	**0.06**
GW25	**Minimum**	**8.80**	**7.09**	**3810.00**	**2610.00**	**38.00**	**0.06**
GW25	**Maximum**	**9.99**	**7.70**	**6210.00**	**3390.00**	**126.00**	**0.06**
GW25	**Standard deviation**	**0.46**	**0.24**	**982.30**	**303.12**	**30.99**	**N/A**
GW26	14/02/11	39.71	6.7	4750	3190	24	4.19
GW26	12/04/11	39.85	6.3	4730	3350	45	3.33
GW26	7/07/11	38.94	6.8	4390	2950	18	2.74
GW26	23/08/11	38.07	6.7	4340	3020	28	2.79
GW26	17/11/11	No access	No access	No access	No access	No access	No access
GW26	16/01/12	36.43	5.9	3770	3110	14	1.52
GW26	**Mean**	**38.60**	**6.46**	**4396.00**	**3124.00**	**25.80**	**2.91**
GW26	**Minimum**	**36.43**	**5.85**	**3770.00**	**2950.00**	**14.00**	**1.52**
GW26	**Maximum**	**39.85**	**6.76**	**4750.00**	**3350.00**	**45.00**	**4.19**
GW26	**Standard deviation**	**1.41**	**0.39**	**397.47**	**155.50**	**12.01**	**0.97**

Appendix 7 – Water Quality Monitoring Results continued

Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
GW27	14/02/11	30.45	6.8	4840	3420	16	<0.05
GW27	12/04/11	40.29	6.4	4960	3580	12	0.11
GW27	7/07/11	39.37	6.9	4600	3170	44	0.23
GW27	23/08/11	38.76	7.0	4830	3460	13	<0.05
GW27	17/11/11	No access	No access	No access	No access	No access	No access
GW27	16/01/12	37.30	6.5	2445	2220	<5	<0.05
GW27	**Mean**	**37.23**	**6.71**	**4335.00**	**3170.00**	**21.25**	**0.17**
GW27	**Minimum**	**30.45**	**6.40**	**2445.00**	**2220.00**	**12.00**	**0.11**
GW27	**Maximum**	**40.29**	**7.00**	**4960.00**	**3580.00**	**44.00**	**0.23**
GW27	**Standard deviation**	**3.95**	**0.25**	**1064.54**	**551.63**	**15.26**	**0.08**
GW37	14/02/11	No access	No access	No access	No access	No access	No access
GW37	12/04/11	64.34	7.0	3980	2370	121	<0.05
GW37	7/07/11	60.94	6.9	3940	2280	58	<0.05
GW37	23/08/11	No access	No access	No access	No access	No access	No access
GW37	17/11/11	No access	No access	No access	No access	No access	No access
GW37	16/01/12	No access	No access	No access	No access	No access	No access
GW37	**Mean**	**62.64**	**6.93**	**3960.00**	**2325.00**	**89.50**	**N/A**
GW37	**Minimum**	**60.94**	**6.85**	**3940.00**	**2280.00**	**58.00**	**N/A**
GW37	**Maximum**	**64.34**	**7.00**	**3980.00**	**2370.00**	**121.00**	**N/A**
GW37	**Standard deviation**	**2.40**	**0.11**	**28.28**	**63.64**	**44.55**	**N/A**
BCGW18	14/02/11	5.11	8.5	4740	2530	16	0.19
BCGW18	12/04/11	5.13	8.0	4730	2610	22	0.11
BCGW18	7/07/11	5.01	8.6	4800	2440	14	0.18
BCGW18	23/08/11	5.03	8.8	4900	2620	14	0.12
BCGW18	17/11/11	No access	No access	No access	No access	No access	No access
BCGW18	16/01/12	4.90	8.0	4210	2500	<5	0.33
BCGW18	**Mean**	**5.04**	**8.37**	**4676.00**	**2540.00**	**16.50**	**0.19**
BCGW18	**Minimum**	**4.90**	**7.99**	**4210.00**	**2440.00**	**14.00**	**0.11**
BCGW18	**Maximum**	**5.13**	**8.80**	**4900.00**	**2620.00**	**22.00**	**0.33**
BCGW18	**Standard deviation**	**0.09**	**0.36**	**269.13**	**75.83**	**3.79**	**0.09**
OD1078	14/02/11	7.91	7.6	7730	4490	6	0.24
OD1078	12/04/11	8.04	6.5	7650	4380	16	0.43
OD1078	7/07/11	7.62	7.3	7550	4280	<5	0.08
OD1078	23/08/11	7.66	7.6	7940	4820	8	<0.05
OD1078	17/11/11	No access	No access	No access	No access	No access	No access
OD1078	16/01/12	7.40	6.9	5920	4560	58	2.54
OD1078	**Mean**	**7.73**	**7.17**	**7358.00**	**4506.00**	**22.00**	**0.82**
OD1078	**Minimum**	**7.40**	**6.50**	**5920.00**	**4280.00**	**6.00**	**0.08**
OD1078	**Maximum**	**8.04**	**7.60**	**7940.00**	**4820.00**	**58.00**	**2.54**
OD1078	**Standard deviation**	**0.25**	**0.47**	**816.56**	**205.38**	**24.39**	**1.15**
OD1078 - Piezo	14/02/11	22.03	7.5	7490	7740	69	0.88
OD1078 - Piezo	12/04/11	21.97	6.4	7650	4320	38	1.56
OD1078 - Piezo	7/07/11	21.25	7.7	7590	4450	0	<0.05
OD1078 - Piezo	23/08/11	22.16	7.2	7800	4610	44	2.6
OD1078 - Piezo	17/11/11	No access	No access	No access	No access	No access	No access
OD1078 - Piezo	16/01/12	22.21	7.1	6270	4160	10	0.06
OD1078 - Piezo	**Mean**	**21.92**	**7.17**	**7360.00**	**5056.00**	**32.20**	**1.28**
OD1078 - Piezo	**Minimum**	**21.25**	**6.40**	**6270.00**	**4160.00**	**0.00**	**0.06**
OD1078 - Piezo	**Maximum**	**22.21**	**7.65**	**7800.00**	**7740.00**	**69.00**	**2.60**
OD1078 - Piezo	**Standard deviation**	**0.39**	**0.48**	**619.60**	**1509.51**	**27.64**	**1.08**
OD1074	14/02/11	25.68	7.5	7860	4840	176	0.12
OD1074	12/04/11	27.04	6.4	7570	4560	1320	0.08
OD1074	7/07/11	25.35	7.1	7520	4510	51	0.16
OD1074	23/08/11	26.36	7.2	7470	4820	93	<0.05
OD1074	17/11/11	No access	No access	No access	No access	No access	No access
OD1074	16/01/12	23.71	5.4	5970	4180	60	0.11
OD1074	**Mean**	**25.63**	**6.72**	**7278.00**	**4582.00**	**340.00**	**0.12**
OD1074	**Minimum**	**23.71**	**5.39**	**5970.00**	**4180.00**	**51.00**	**0.08**
OD1074	**Maximum**	**27.04**	**7.50**	**7860.00**	**4840.00**	**1320.00**	**0.16**
OD1074	**Standard deviation**	**1.25**	**0.85**	**746.71**	**269.48**	**550.05**	**0.03**
OD1074 - Peizo	14/02/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1074 - Peizo	12/04/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1074 - Peizo	7/07/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1074 - Peizo	23/08/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1074 - Peizo	17/11/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1074 - Peizo	16/01/12	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked

Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
OD1079 - Peizo	14/02/11	54.43	12.1	4910	3470	79	<0.05
OD1079 - Peizo	12/04/11	54.29	10.6	4820	2050	66	<0.05
OD1079 - Peizo	7/07/11	54.24	12.0	5030	1930	58	<0.05
OD1079 - Peizo	23/08/11	54.08	12.3	4910	2090	40	<0.05
OD1079 - Peizo	17/11/11	No access	No access	No access	No access	No access	No access
OD1079 - Peizo	16/01/12	53.42	10.0	4620	2040	7	<0.05
OD1079 - Peizo	**Mean**	**54.09**	**11.39**	**4858.00**	**2316.00**	**50.00**	**N/A**
OD1079 - Peizo	**Minimum**	**53.42**	**9.96**	**4620.00**	**1930.00**	**7.00**	**N/A**
OD1079 - Peizo	**Maximum**	**54.43**	**12.30**	**5030.00**	**3470.00**	**79.00**	**N/A**
OD1079 - Peizo	**Standard deviation**	**0.40**	**1.04**	**152.55**	**647.83**	**27.88**	**N/A**
OD1082 - Peizo	14/02/11	61.29	8.7	1893	1090	40	<0.05
OD1082 - Peizo	12/04/11	61.75	8.0	1851	1010	40	<0.05
OD1082 - Peizo	7/07/11	62.09	8.2	1884	968	43	<0.05
OD1082 - Peizo	23/08/11	61.99	7.7	1946	1120	21	<0.05
OD1082 - Peizo	17/11/11	No access	No access	No access	No access	No access	No access
OD1082 - Peizo	16/01/12	62.11	7.4	1760	1060	12	<0.05
OD1082 - Peizo	**Mean**	**61.85**	**7.99**	**1866.80**	**1049.60**	**31.20**	**N/A**
OD1082 - Peizo	**Minimum**	**61.29**	**7.37**	**1760.00**	**968.00**	**12.00**	**N/A**
OD1082 - Peizo	**Maximum**	**62.11**	**8.70**	**1946.00**	**1120.00**	**43.00**	**N/A**
OD1082 - Peizo	**Standard deviation**	**0.34**	**0.50**	**68.76**	**61.08**	**13.85**	**N/A**
OD1046	14/02/11	36.58	7.5	5310	2970	78	<0.05
OD1046	12/04/11	36.60	7.1	5090	2860	275	<0.05
OD1046	7/07/11	36.65	7.3	5200	2780	388	<0.05
OD1046	23/08/11	36.64	7.1	5310	3090	162	<0.05
OD1046	17/11/11	No access	No access	No access	No access	No access	No access
OD1046	16/01/12	36.83	6.0	4140	3460	22	<0.05
OD1046	**Mean**	**36.66**	**7.01**	**5010.00**	**3032.00**	**185.00**	**N/A**
OD1046	**Minimum**	**36.58**	**6.04**	**4140.00**	**2780.00**	**22.00**	**N/A**
OD1046	**Maximum**	**36.83**	**7.50**	**5310.00**	**3460.00**	**388.00**	**N/A**
OD1046	**Standard deviation**	**0.10**	**0.56**	**494.82**	**266.21**	**148.20**	**N/A**
OD1046 - Piezo	14/02/11	74.88	10.5	3220	1920	148	<0.05
OD1046 - Piezo	12/04/11	75.44	9.9	3670	2040	206	<0.05
OD1046 - Piezo	7/07/11	75.94	10.6	3480	1830	117	<0.05
OD1046 - Piezo	23/08/11	76.31	10.9	4220	2010	94	<0.05
OD1046 - Piezo	17/11/11	No access	No access	No access	No access	No access	No access
OD1046 - Piezo	16/01/12	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OD1046 - Piezo	**Mean**	**75.64**	**10.48**	**3647.50**	**1950.00**	**141.25**	**N/A**
OD1046 - Piezo	**Minimum**	**74.88**	**9.90**	**3220.00**	**1830.00**	**94.00**	**N/A**
OD1046 - Piezo	**Maximum**	**76.31**	**10.90**	**4220.00**	**2040.00**	**206.00**	**N/A**
OD1046 - Piezo	**Standard deviation**	**0.62**	**0.42**	**423.90**	**94.87**	**48.51**	**N/A**
BCGW05	14/02/11	13.80	7.6	8450	4740	34	9.62
BCGW05	12/04/11	13.83	7.1	7680	4270	46	6.65
BCGW05	7/07/11	13.78	7.6	7230	4260	44	8.63
BCGW05	23/08/11	13.58	7.9	7630	4520	39	4.28
BCGW05	17/11/11	No access	No access	No access	No access	No access	No access
BCGW05	16/01/12	13.77	7.5	6470	4830	7	3.44
BCGW05	**Mean**	**13.75**	**7.55**	**7492.00**	**4524.00**	**34.00**	**6.52**
BCGW05	**Minimum**	**13.58**	**7.10**	**6470.00**	**4260.00**	**7.00**	**3.44**
BCGW05	**Maximum**	**13.83**	**7.90**	**8450.00**	**4830.00**	**46.00**	**9.62**
BCGW05	**Standard deviation**	**0.10**	**0.29**	**722.02**	**261.97**	**15.80**	**2.67**
BCGW15	14/02/11	15.71	7.3	7790	5090	8	<0.05
BCGW15	12/04/11	15.78	6.5	7600	4770	<5	<0.05
BCGW15	7/07/11	15.92	7.1	6870	4150	46	<0.05
BCGW15	23/08/11	No access	No access	No access	No access	No access	No access
BCGW15	17/11/11	No access	No access	No access	No access	No access	No access
BCGW15	16/01/12	15.41	7.5	1878	1380	43	0.74
BCGW15	**Mean**	**15.71**	**7.08**	**6034.50**	**3847.50**	**32.33**	**0.74**
BCGW15	**Minimum**	**15.41**	**6.50**	**1878.00**	**1380.00**	**8.00**	**0.74**
BCGW15	**Maximum**	**15.92**	**7.45**	**7790.00**	**5090.00**	**46.00**	**0.74**
BCGW15	**Standard deviation**	**0.22**	**0.42**	**2799.23**	**1690.65**	**21.13**	**N/A**

Appendix 7 – Water Quality Monitoring Results continued

Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
BCGW22	14/02/11	5.02	7.3	13810	8280	65	26.0
BCGW22	12/04/11	5.04	6.7	13370	7880	50	24.2
BCGW22	7/07/11	4.94	7.4	12250	6760	50	25.5
BCGW22	23/08/11	4.98	7.2	12770	8500	82	26.4
BCGW22	17/11/11	No access	No access	No access	No access	No access	No access
BCGW22	16/01/12	4.70	6.3	9750	9230	112	30.2
BCGW22	**Mean**	**4.94**	**6.98**	**12390.00**	**8130.00**	**71.80**	**26.46**
BCGW22	**Minimum**	**4.70**	**6.25**	**9750.00**	**6760.00**	**50.00**	**24.20**
BCGW22	**Maximum**	**5.04**	**7.44**	**13810.00**	**9230.00**	**112.00**	**30.20**
BCGW22	**Standard deviation**	**0.14**	**0.49**	**1589.84**	**909.51**	**26.06**	**2.25**
OD1049 - Surface	14/02/11	26.47	8.0	12420	7660	50	<0.05
OD1049 - Surface	12/04/11	26.58	7.7	12250	7280	12	<0.05
OD1049 - Surface	7/07/11	26.41	7.1	12030	7070	6	0.09
OD1049 - Surface	23/08/11	26.35	7.3	12360	7530	20	<0.05
OD1049 - Surface	17/11/11	No access	No access	No access	No access	No access	No access
OD1049 - Surface	16/01/12	26.41	7.0	10290	7100	12	0.20
OD1049 - Surface	**Mean**	**26.44**	**7.43**	**11870.00**	**7328.00**	**20.00**	**0.15**
OD1049 - Surface	**Minimum**	**26.35**	**7.00**	**10290.00**	**7070.00**	**6.00**	**0.09**
OD1049 - Surface	**Maximum**	**26.58**	**8.00**	**12420.00**	**7660.00**	**50.00**	**0.20**
OD1049 - Surface	**Standard deviation**	**0.09**	**0.41**	**895.68**	**260.71**	**17.49**	**0.08**
OD1049 - WH	14/02/11	25.48	11.9	3100	1440	65	0.05
OD1049 - WH	12/04/11	25.48	11.5	3100	1460	115	<0.05
OD1049 - WH	7/07/11	25.48	11.6	3180	1230	77	<0.05
OD1049 - WH	23/08/11	25.47	12.1	3230	1440	82	<0.05
OD1049 - WH	17/11/11	No access	No access	No access	No access	No access	No access
OD1049 - WH	16/01/12	25.69	11.2	3090	1480	30	<0.05
OD1049 - WH	**Mean**	**25.52**	**11.65**	**3140.00**	**1410.00**	**73.80**	**0.05**
OD1049 - WH	**Minimum**	**25.47**	**11.15**	**3090.00**	**1230.00**	**30.00**	**0.05**
OD1049 - WH	**Maximum**	**25.69**	**12.10**	**3230.00**	**1480.00**	**115.00**	**0.05**
OD1049 - WH	**Standard deviation**	**0.10**	**0.37**	**62.05**	**101.98**	**30.70**	**N/A**
BCGW10	14/02/11	8.02	8.1	2710	1540	7	<0.05
BCGW10	12/04/11	8.13	8.0	2660	1620	5	<0.05
BCGW10	7/07/11	7.83	8.3	2720	1520	6	<0.05
BCGW10	23/08/11	7.56	8.5	2730	1520	6	<0.05
BCGW10	17/11/11	No access	No access	No access	No access	No access	No access
BCGW10	16/01/12	5.90	8.1	2548	1640	12	<0.05
BCGW10	**Mean**	**7.49**	**8.20**	**2673.60**	**1568.00**	**7.20**	**N/A**
BCGW10	**Minimum**	**5.90**	**8.00**	**2548.00**	**1520.00**	**5.00**	**N/A**
BCGW10	**Maximum**	**8.13**	**8.50**	**2730.00**	**1640.00**	**12.00**	**N/A**
BCGW10	**Standard deviation**	**0.91**	**0.20**	**75.20**	**57.62**	**2.77**	**N/A**
BCGW11	14/02/11	8.55	7.8	1564	718	8	0.08
BCGW11	12/04/11	8.59	8.2	985	596	6	0.08
BCGW11	7/07/11	7.40	8.0	580	424	37	0.06
BCGW11	23/08/11	8.10	7.7	687	426	11	<0.05
BCGW11	17/11/11	No access	No access	No access	No access	No access	No access
BCGW11	16/01/12	6.60	7.6	1195	734	22	<0.05
BCGW11	**Mean**	**7.85**	**7.87**	**1002.20**	**579.60**	**16.80**	**0.07**
BCGW11	**Minimum**	**6.60**	**7.64**	**580.00**	**424.00**	**6.00**	**0.06**
BCGW11	**Maximum**	**8.59**	**8.20**	**1564.00**	**734.00**	**37.00**	**0.08**
BCGW11	**Standard deviation**	**0.85**	**0.23**	**397.08**	**150.89**	**12.87**	**0.01**
BCGW12	14/02/11	9.85	7.4	5090	2590	20	4.83
BCGW12	12/04/11	9.48	5.9	3780	2010	8	0.91
BCGW12	7/07/11	7.33	7.5	4220	1850	14	2.03
BCGW12	23/08/11	8.85	8.7	3000	2050	8	0.31
BCGW12	17/11/11	No access	No access	No access	No access	No access	No access
BCGW12	16/01/12	7.49	7.3	3900	2120	<5	1.02
BCGW12	**Mean**	**8.60**	**7.36**	**3998.00**	**2124.00**	**12.50**	**1.82**
BCGW12	**Minimum**	**7.33**	**5.92**	**3000.00**	**1850.00**	**8.00**	**0.31**
BCGW12	**Maximum**	**9.85**	**8.70**	**5090.00**	**2590.00**	**20.00**	**4.83**
BCGW12	**Standard deviation**	**1.15**	**0.98**	**757.44**	**278.71**	**5.74**	**1.79**

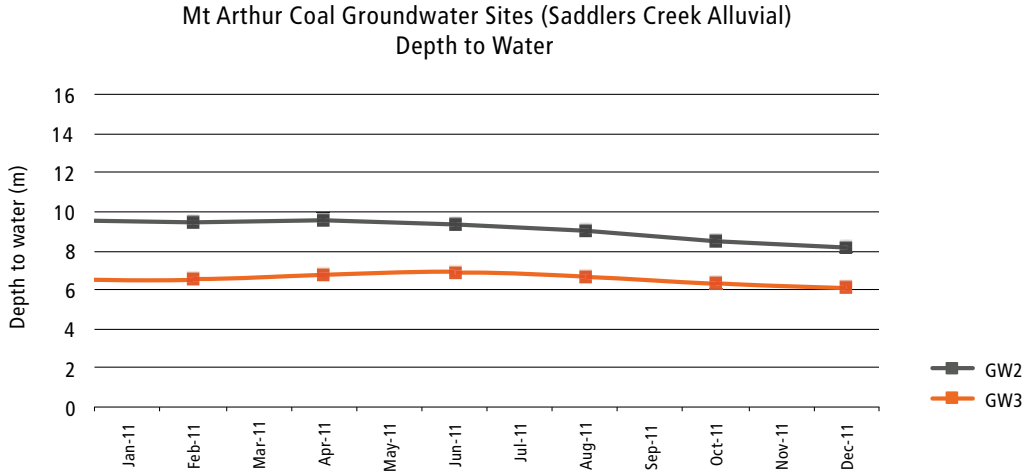
Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
EWPC33	14/02/11	34.34	7.4	2377	1100	20	1.18
EWPC33	12/04/11	33.77	6.7	2370	1430	10	0.63
EWPC33	7/07/11	33.57	7.2	2149	1200	20	0.95
EWPC33	23/08/11	33.31	7.3	1985	1140	8	<0.05
EWPC33	17/11/11	No access	No access	No access	No access	No access	No access
EWPC33	16/01/12	32.87	7.3	1697	870	9	0.09
EWPC33	**Mean**	**33.57**	**7.17**	**2115.60**	**1148.00**	**13.40**	**0.71**
EWPC33	**Minimum**	**32.87**	**6.70**	**1697.00**	**870.00**	**8.00**	**0.09**
EWPC33	**Maximum**	**34.34**	**7.40**	**2377.00**	**1430.00**	**20.00**	**1.18**
EWPC33	**Standard deviation**	**0.55**	**0.28**	**285.68**	**201.17**	**6.07**	**0.47**
OR2051	14/02/11	11.90	7.2	2830	1880	14	0.88
OR2051	12/04/11	12.15	7.1	2920	1810	9	0.48
OR2051	7/07/11	12.40	7.2	3240	1560	6	0.53
OR2051	23/08/11	12.36	7.7	2800	1560	<5	<0.05
OR2051	17/11/11	No access	No access	No access	No access	No access	No access
OR2051	16/01/12	12.29	7.3	2209	1230	21	0.38
OR2051	**Mean**	**12.22**	**7.29**	**2799.80**	**1608.00**	**12.50**	**0.57**
OR2051	**Minimum**	**11.90**	**7.10**	**2209.00**	**1230.00**	**6.00**	**0.38**
OR2051	**Maximum**	**12.40**	**7.70**	**3240.00**	**1880.00**	**21.00**	**0.88**
OR2051	**Standard deviation**	**0.20**	**0.24**	**373.56**	**256.07**	**6.56**	**0.22**
OR2051 - Piezo	14/02/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OR2051 - Piezo	12/04/11	57.12	5.3	3250	1930	13	0.29
OR2051 - Piezo	7/07/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OR2051 - Piezo	23/08/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OR2051 - Piezo	17/11/11	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OR2051 - Piezo	16/01/12	Blocked	Blocked	Blocked	Blocked	Blocked	Blocked
OR2051 - Piezo	**Mean**	**57.12**	**5.30**	**3250.00**	**1930.00**	**13.00**	**0.29**
OR2051 - Piezo	**Minimum**	**57.12**	**5.30**	**3250.00**	**1930.00**	**13.00**	**0.29**
OR2051 - Piezo	**Maximum**	**57.12**	**5.30**	**3250.00**	**1930.00**	**13.00**	**0.29**
OR2051 - Piezo	**Standard deviation**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
OD1073	14/02/11	17.65	7.0	3290	2010	10	0.36
OD1073	12/04/11	16.83	7.1	3320	2260	6	0.15
OD1073	7/07/11	16.62	7.0	3980	2330	12	0.13
OD1073	23/08/11	16.29	7.2	3560	2040	<5	0.87
OD1073	17/11/11	No access	No access	No access	No access	No access	No access
OD1073	16/01/12	15.46	6.9	3170	2110	<5	0.59
OD1073	**Mean**	**16.57**	**7.04**	**3464.00**	**2150.00**	**9.33**	**0.42**
OD1073	**Minimum**	**15.46**	**6.88**	**3170.00**	**2010.00**	**6.00**	**0.13**
OD1073	**Maximum**	**17.65**	**7.20**	**3980.00**	**2330.00**	**12.00**	**0.87**
OD1073	**Standard deviation**	**0.80**	**0.12**	**321.29**	**139.46**	**3.06**	**0.31**
OD1073 - Piezo	14/02/11	18.29	7.4	4230	2360	30	<0.05
OD1073 - Piezo	12/04/11	19.55	6.9	3950	2050	10	0.1
OD1073 - Piezo	7/07/11	20.75	7.4	4190	2320	40	0.09
OD1073 - Piezo	23/08/11	23.56	7.3	4220	2450	34	<0.05
OD1073 - Piezo	17/11/11	No access	No access	No access	No access	No access	No access
OD1073 - Piezo	16/01/12	15.82	7.1	3770	2470	185	<0.05
OD1073 - Piezo	**Mean**	**19.59**	**7.23**	**4072.00**	**2330.00**	**59.80**	**0.10**
OD1073 - Piezo	**Minimum**	**15.82**	**6.90**	**3770.00**	**2050.00**	**10.00**	**0.09**
OD1073 - Piezo	**Maximum**	**23.56**	**7.42**	**4230.00**	**2470.00**	**185.00**	**0.10**
OD1073 - Piezo	**Standard deviation**	**2.87**	**0.22**	**204.25**	**168.37**	**70.89**	**0.01**
BCGW19	14/02/11	6.08	7.4	5170	3100	6	0.34
BCGW19	12/04/11	6.20	7.7	3630	2180	8	0.06
BCGW19	7/07/11	5.39	7.9	3100	2520	8	0.26
BCGW19	23/08/11	5.80	7.7	4560	2710	6	0.06
BCGW19	17/11/11	No access	No access	No access	No access	No access	No access
BCGW19	16/01/12	5.23	8.1	1205	818	18	0.11
BCGW19	**Mean**	**5.74**	**7.75**	**3533.00**	**2265.60**	**9.20**	**0.17**
BCGW19	**Minimum**	**5.23**	**7.40**	**1205.00**	**818.00**	**6.00**	**0.06**
BCGW19	**Maximum**	**6.20**	**8.10**	**5170.00**	**3100.00**	**18.00**	**0.34**
BCGW19	**Standard deviation**	**0.42**	**0.26**	**1528.97**	**874.83**	**5.02**	**0.13**

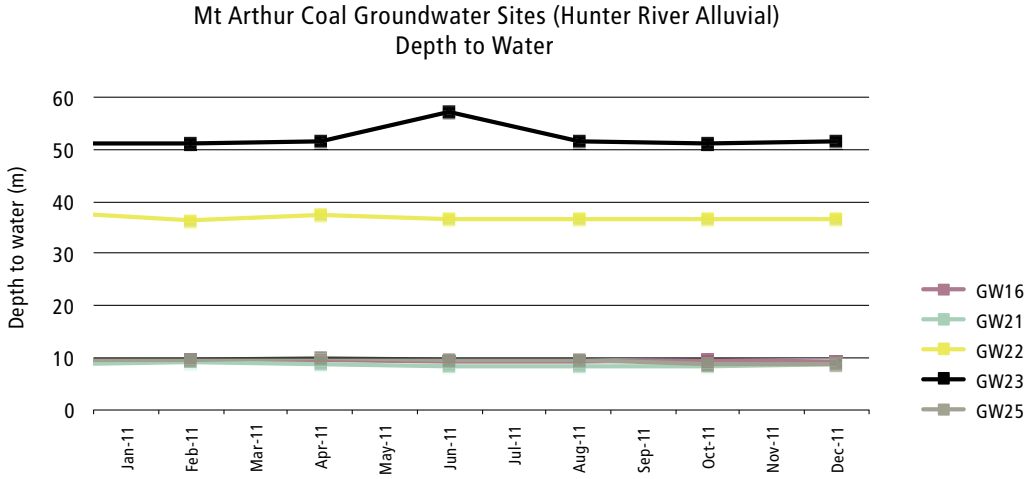
Appendix 7 – Water Quality Monitoring Results continued

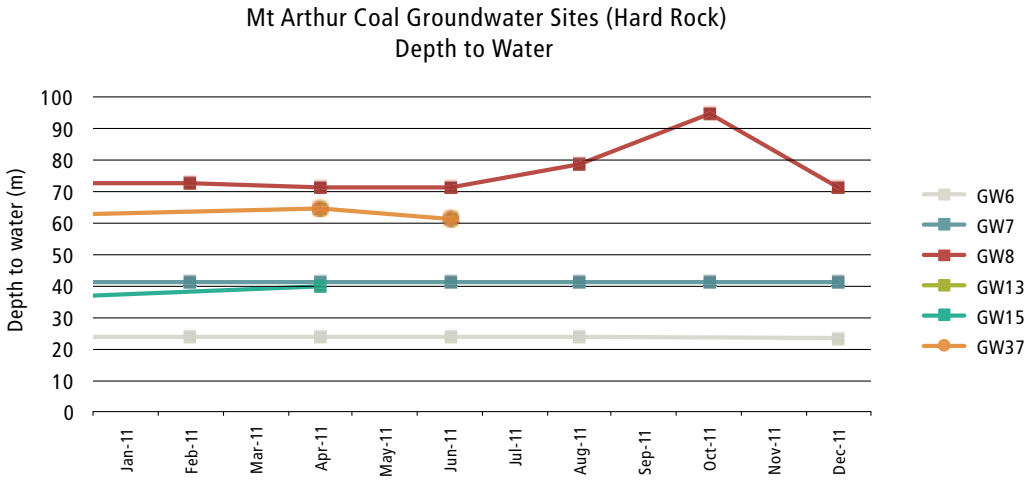
Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
GW39P	14/02/11	8.99	7.8	5620	3550	40	0.85
GW39P	12/04/11	8.98	7.4	5740	3760	120	0.95
GW39P	7/07/11	8.80	7.4	5750	3370	93	2.00
GW39P	23/08/11	8.83	7.7	5750	3610	88	1.82
GW39P	17/11/11	8.62	7.8	5650	3710	54	<0.05
GW39P	16/01/12	8.84	7.2	5430	3530	225	1.79
GW39P	**Mean**	**8.84**	**7.55**	**5656.67**	**3588.33**	**103.33**	**1.48**
GW39P	**Minimum**	**8.62**	**7.19**	**5430.00**	**3370.00**	**40.00**	**0.85**
GW39P	**Maximum**	**8.99**	**7.80**	**5750.00**	**3760.00**	**225.00**	**2.00**
GW39P	**Standard deviation**	**0.14**	**0.24**	**124.20**	**139.49**	**66.13**	**0.54**
GW39A	14/02/11	9.37	7.3	5510	3000	2680	0.13
GW39A	12/04/11	9.37	5.9	5390	3280	1150	<0.05
GW39A	7/07/11	9.28	7.1	5460	3140	608	0.1
GW39A	23/08/11	9.25	7.3	5410	3370	570	0.08
GW39A	17/11/11	9.24	7.4	5310	3440	286	1.68
GW39A	16/01/12	9.14	6.8	5010	3530	35	<0.05
GW39A	**Mean**	**9.28**	**6.96**	**5348.33**	**3293.33**	**888.17**	**0.50**
GW39A	**Minimum**	**9.14**	**5.90**	**5010.00**	**3000.00**	**35.00**	**0.08**
GW39A	**Maximum**	**9.37**	**7.39**	**5510.00**	**3530.00**	**2680.00**	**1.68**
GW39A	**Standard deviation**	**0.09**	**0.57**	**178.93**	**196.54**	**953.88**	**0.79**
GW40A	14/02/11	10.20	7.8	4060	2600	226	<0.05
GW40A	12/04/11	10.28	6.7	4070	2430	182	<0.05
GW40A	7/07/11	9.99	7.3	4050	2430	166	<0.05
GW40A	23/08/11	9.70	7.4	4550	2870	586	<0.05
GW40A	17/11/11	9.93	7.6	4650	3100	306	<0.05
GW40A	16/01/12	9.68	6.9	4050	2830	47	<0.05
GW40A	**Mean**	**9.96**	**7.26**	**4238.33**	**2710.00**	**252.17**	**N/A**
GW40A	**Minimum**	**9.68**	**6.70**	**4050.00**	**2430.00**	**47.00**	**N/A**
GW40A	**Maximum**	**10.28**	**7.80**	**4650.00**	**3100.00**	**586.00**	**N/A**
GW40A	**Standard deviation**	**0.25**	**0.42**	**282.02**	**268.70**	**184.10**	**N/A**
GW40P	14/02/11	10.33	7.9	3490	2280	28	<0.05
GW40P	12/04/11	10.45	7.0	3450	2120	47	<0.05
GW40P	7/07/11	10.19	7.8	3490	2170	39	0.09
GW40P	23/08/11	10.05	8.0	3530	2230	44	0.09
GW40P	17/11/11	10.07	8.2	3360	2210	28	0.12
GW40P	16/01/12	9.83	7.4	3290	2160	54	0.10
GW40P	**Mean**	**10.15**	**7.71**	**3435.00**	**2195.00**	**40.00**	**0.10**
GW40P	**Minimum**	**9.83**	**6.97**	**3290.00**	**2120.00**	**28.00**	**0.09**
GW40P	**Maximum**	**10.45**	**8.15**	**3530.00**	**2280.00**	**54.00**	**0.12**
GW40P	**Standard deviation**	**0.22**	**0.43**	**91.60**	**56.83**	**10.49**	**0.01**
GW41P	14/02/11	7.68	7.5	4270	2500	38	<0.05
GW41P	12/04/11	7.68	7.1	4220	2370	26	<0.05
GW41P	7/07/11	7.60	7.2	4180	2310	51	<0.05
GW41P	23/08/11	7.56	7.4	4210	2490	43	<0.05
GW41P	17/11/11	7.56	7.7	4020	2480	27	<0.05
GW41P	16/01/12	7.43	7.2	3730	1980	37	0.06
GW41P	**Mean**	**7.59**	**7.34**	**4105.00**	**2355.00**	**37.00**	**0.06**
GW41P	**Minimum**	**7.43**	**7.10**	**3730.00**	**1980.00**	**26.00**	**0.06**
GW41P	**Maximum**	**7.68**	**7.67**	**4270.00**	**2500.00**	**51.00**	**0.06**
GW41P	**Standard deviation**	**0.09**	**0.22**	**202.46**	**198.87**	**9.53**	**N/A**
GW41A	14/02/11	7.27	7.7	4600	2780	914	<0.05
GW41A	12/04/11	7.26	6.4	4410	2620	684	<0.05
GW41A	7/07/11	7.24	7.4	4440	2810	2210	<0.05
GW41A	23/08/11	7.23	7.5	4550	2820	774	<0.05
GW41A	17/11/11	7.24	7.7	4400	2830	416	<0.05
GW41A	16/01/12	7.04	7.1	4080	2750	430	<0.05
GW41A	**Mean**	**7.21**	**7.30**	**4413.33**	**2768.33**	**904.67**	**N/A**
GW41A	**Minimum**	**7.04**	**6.40**	**4080.00**	**2620.00**	**416.00**	**N/A**
GW41A	**Maximum**	**7.27**	**7.73**	**4600.00**	**2830.00**	**2210.00**	**N/A**
GW41A	**Standard deviation**	**0.09**	**0.50**	**181.95**	**78.34**	**668.41**	**N/A**

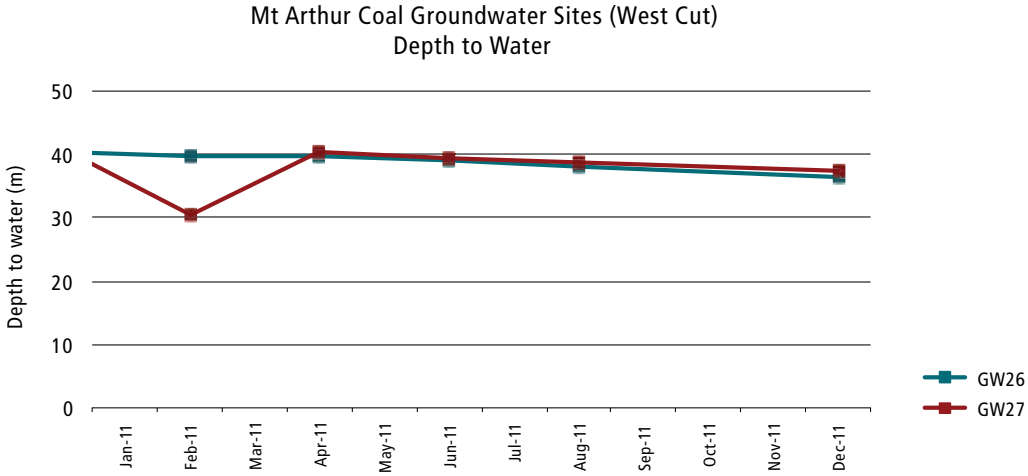
Site	Date	Surface water level (m)	pH	Electrical conductivity (µS/cm)	Total dissolved solids (mg/L)	Total suspended solids (mg/L)	Filterable iron (mg/L)
GW38P	14/02/11	10.07	8.0	2141	1330	16	<0.05
GW38P	12/04/11	9.75	7.4	2119	1200	6	<0.05
GW38P	7/07/11	9.48	7.7	1936	1110	<5	<0.05
GW38P	23/08/11	9.32	7.9	2119	1230	12	<0.05
GW38P	17/11/11	9.87	8.2	2075	1260	54	<0.05
GW38P	16/01/12	9.72	7.4	2053	1230	<5	<0.05
GW38P	**Mean**	**9.70**	**7.77**	**2073.83**	**1226.67**	**22.00**	**N/A**
GW38P	**Minimum**	**9.32**	**7.42**	**1936.00**	**1110.00**	**6.00**	**N/A**
GW38P	**Maximum**	**10.07**	**8.22**	**2141.00**	**1330.00**	**54.00**	**N/A**
GW38P	**Standard deviation**	**0.27**	**0.32**	**74.87**	**72.30**	**21.73**	**N/A**
GW38A	14/02/11	9.30	7.5	4180	2670	38	<0.05
GW38A	12/04/11	9.46	7.3	4270	2640	70	<0.05
GW38A	7/07/11	8.88	7.2	4340	2540	42	<0.05
GW38A	23/08/11	9.01	7.4	4190	2450	28	<0.05
GW38A	17/11/11	9.05	7.5	4310	2560	18	<0.05
GW38A	16/01/12	9.00	6.9	3760	2670	103	<0.05
GW38A	**Mean**	**9.12**	**7.31**	**4175.00**	**2588.33**	**49.83**	**N/A**
GW38A	**Minimum**	**8.88**	**6.94**	**3760.00**	**2450.00**	**18.00**	**N/A**
GW38A	**Maximum**	**9.46**	**7.51**	**4340.00**	**2670.00**	**103.00**	**N/A**
GW38A	**Standard deviation**	**0.22**	**0.22**	**213.05**	**87.50**	**31.38**	**N/A**

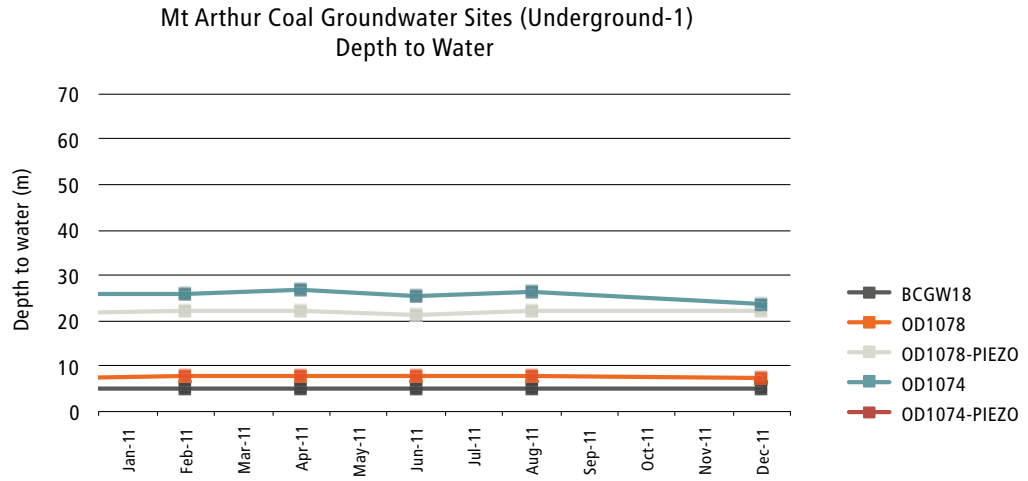
Groundwater Graphs

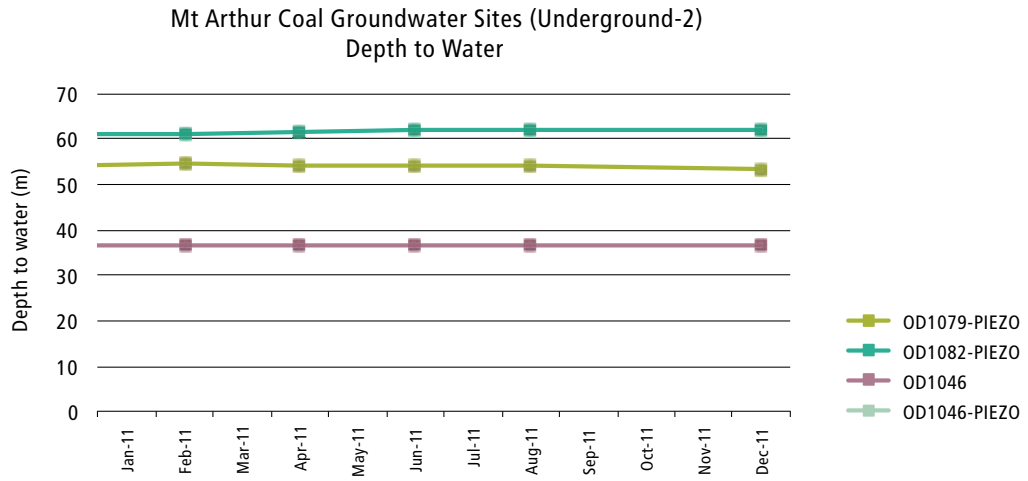


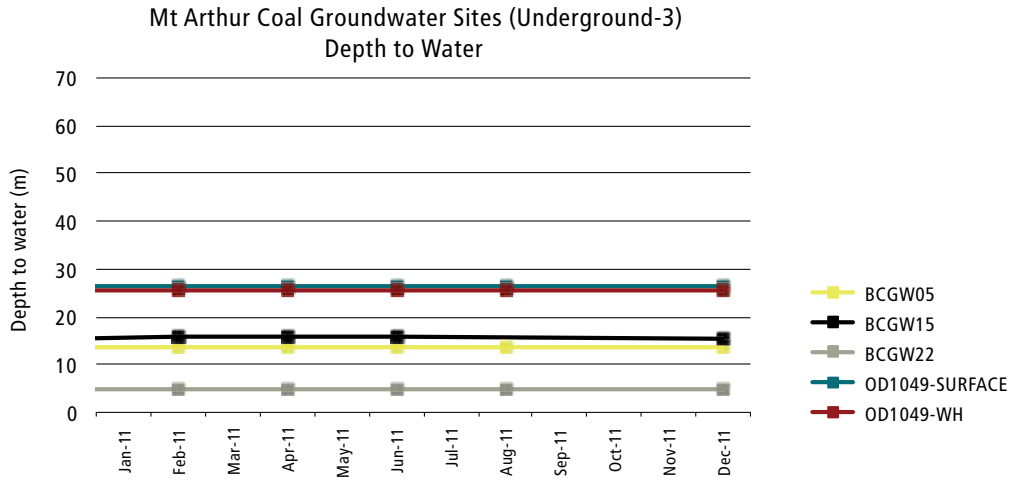


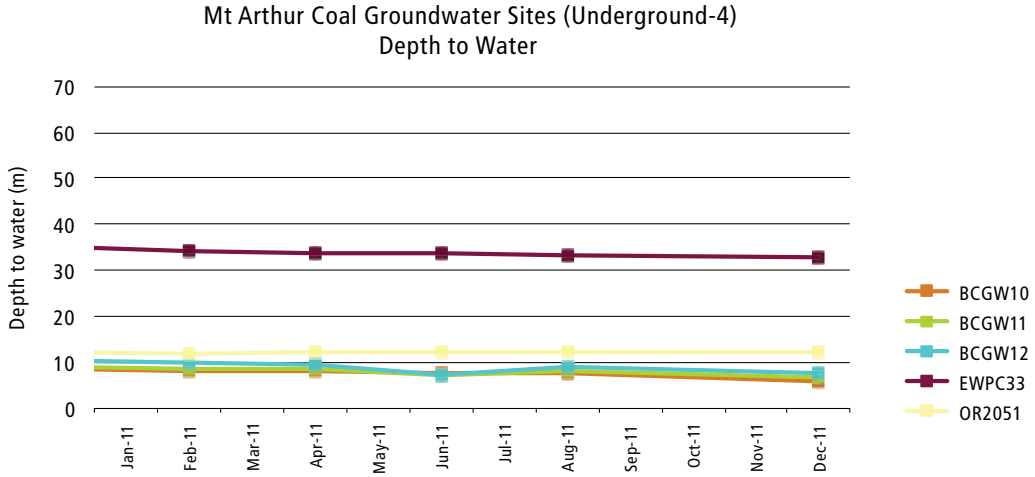


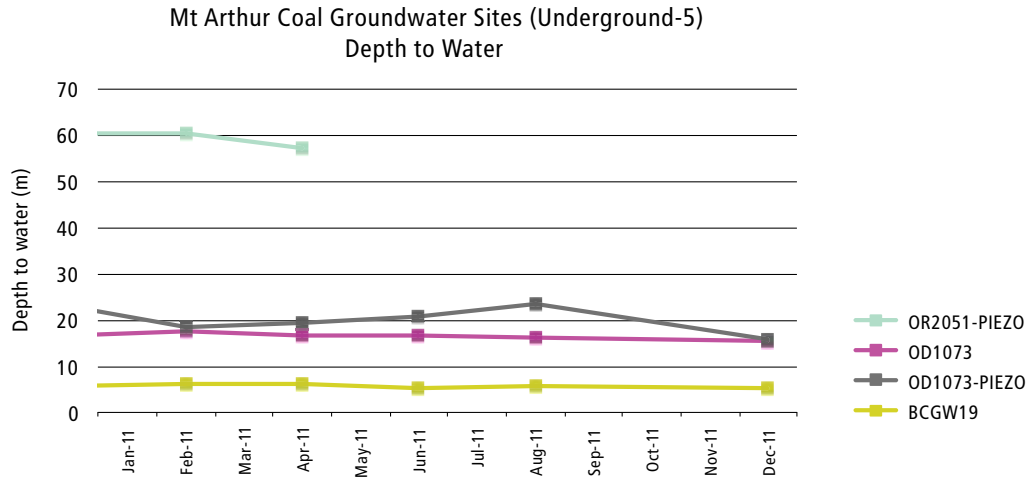

Mt Arthur Coal Groundwater Sites (West Cut)
Depth to Water
Depth to water (m)
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW26
GW27

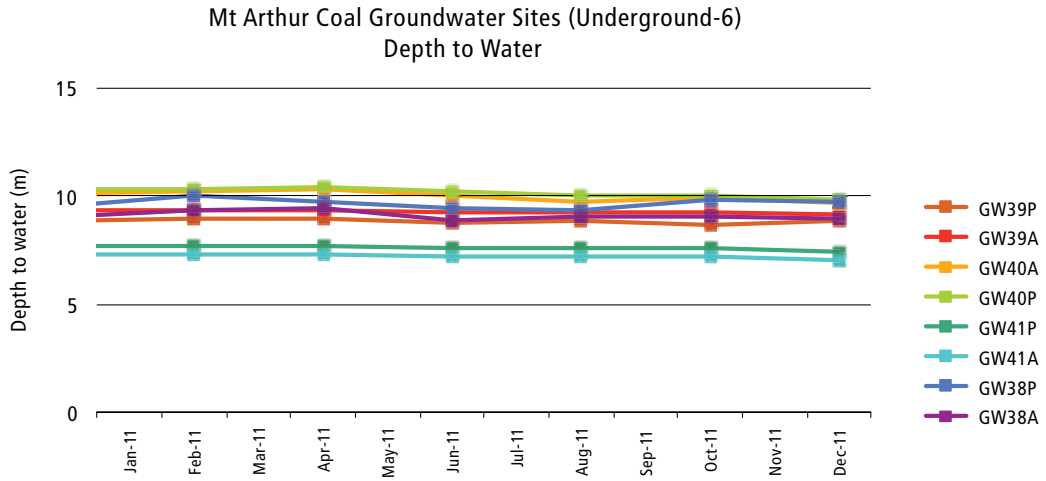

Mt Arthur Coal Groundwater Sites (Underground-1)
Depth to Water
Depth to water (m)
70
60
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
BCGW18
OD1078
OD1078-PIEZO
OD1074
OD1074-PIEZO

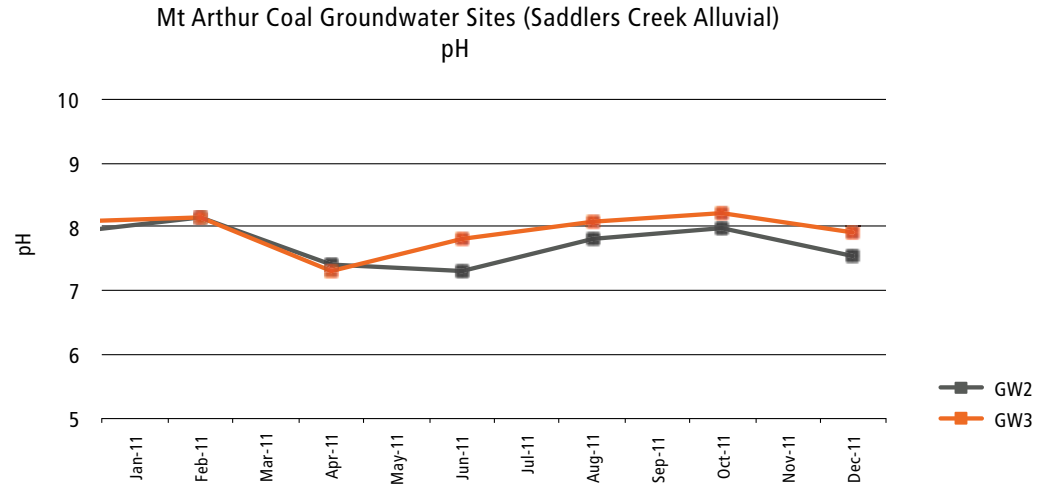

Mt Arthur Coal Groundwater Sites (Underground-2)
Depth to Water
Depth to water (m)
70
60
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
OD1079-PIEZO
OD1082-PIEZO
OD1046
OD1046-PIEZO

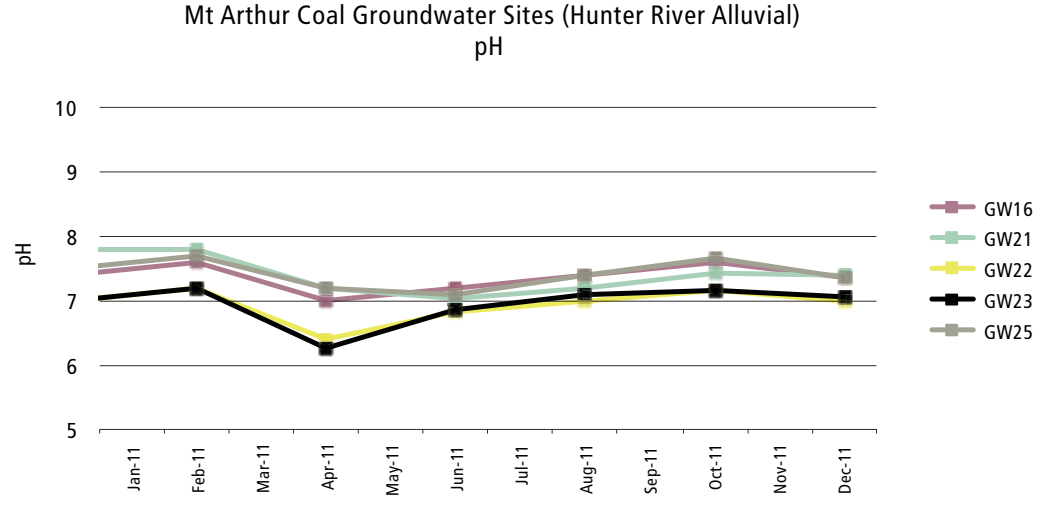

Mt Arthur Coal Groundwater Sites (Underground-3)
Depth to Water
Depth to water (m)
70
60
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
BCGW05
BCGW15
BCGW22
OD1049-SURFACE
OD1049-WH

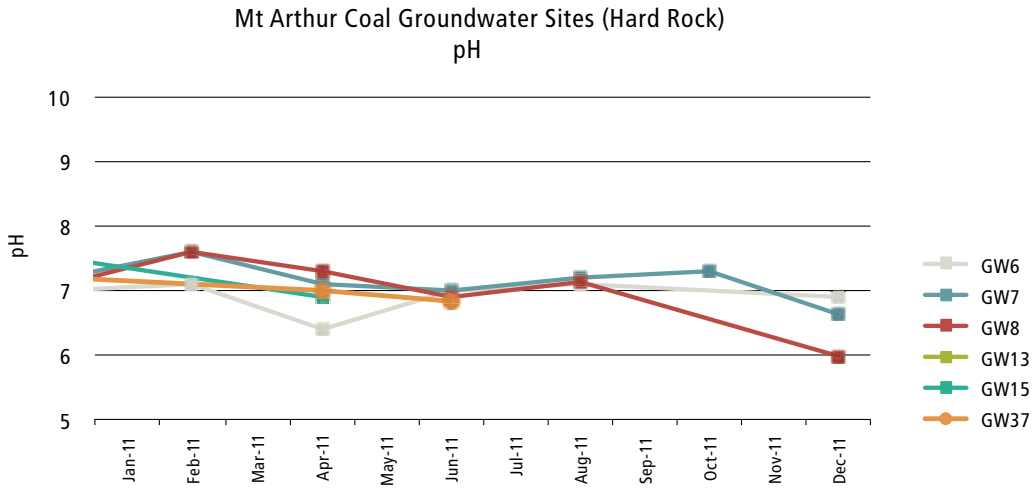

Mt Arthur Coal Groundwater Sites (Underground-4)
Depth to Water
Depth to water (m)
70
60
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
BCGW10
BCGW11
BCGW12
EWPC33
OR2051

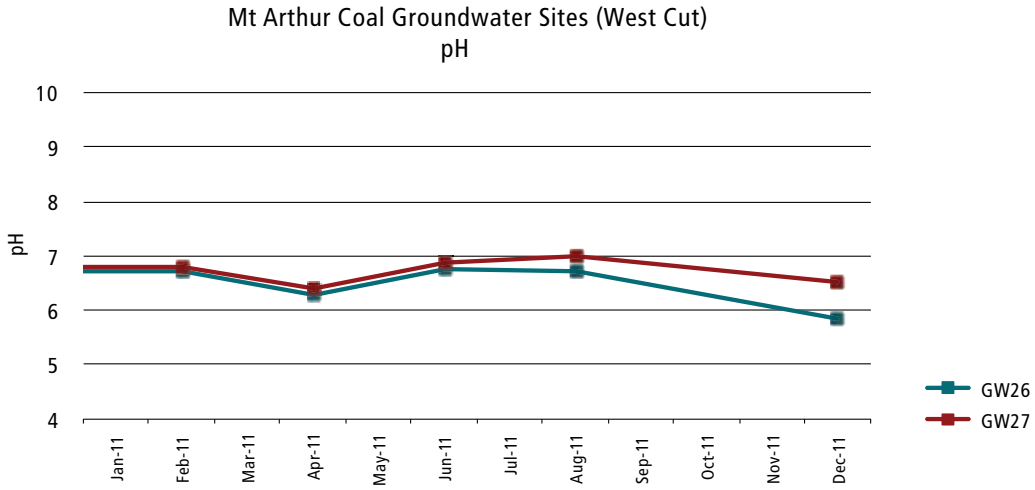

Mt Arthur Coal Groundwater Sites (Underground-5)
Depth to Water
Depth to water (m)
70
60
50
40
30
20
10
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
OR2051-PIEZO
OD1073
OD1073-PIEZO
BCGW19

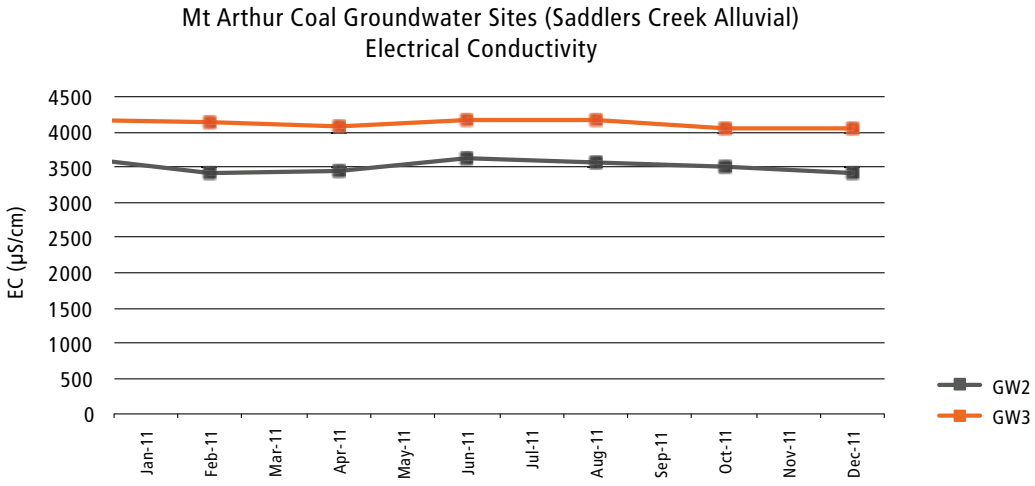

Mt Arthur Coal Groundwater Sites (Underground-6)
Depth to Water
Depth to water (m)
15
10
5
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW39P
GW39A
GW40A
GW40P
GW41P
GW41A
GW38P
GW38A

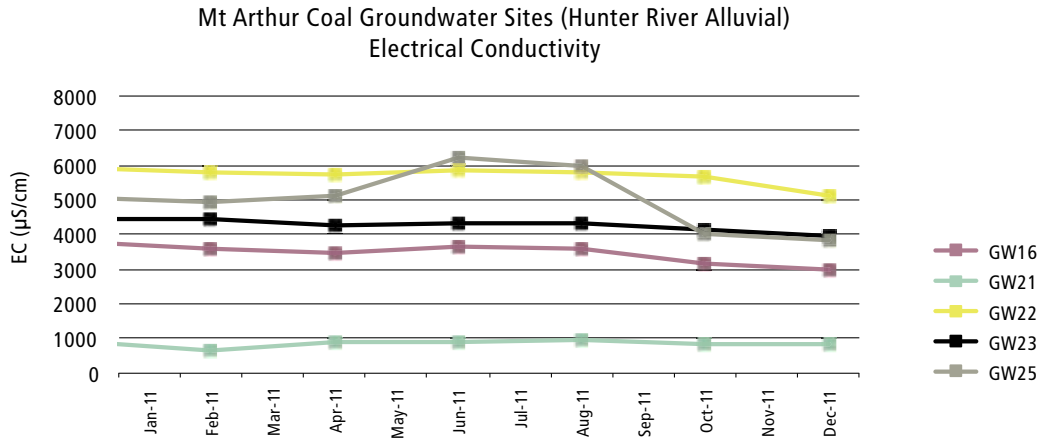

Mt Arthur Coal Groundwater Sites (Saddlers Creek Alluvial)
pH
pH
10
9
8
7
6
5
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW2
GW3

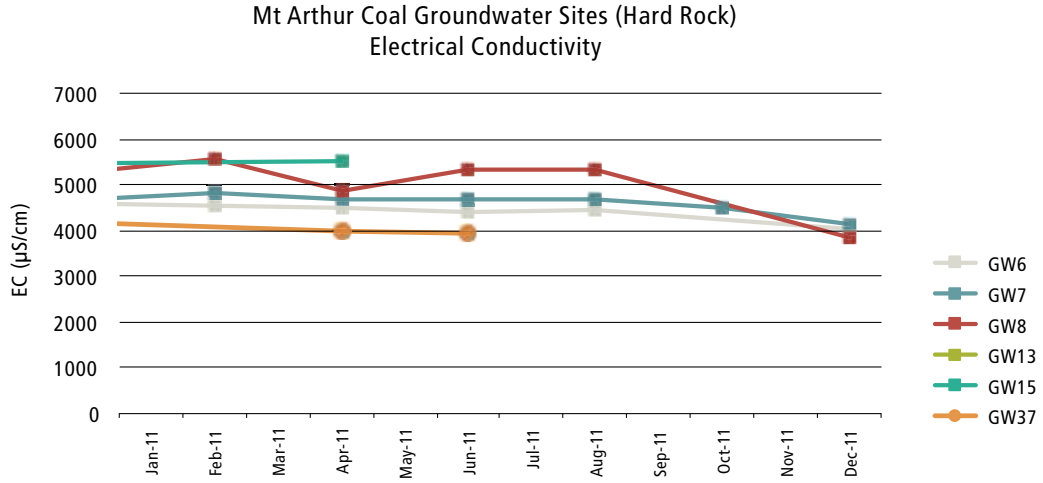

Mt Arthur Coal Groundwater Sites (Hunter River Alluvial)
pH
pH
10
9
8
7
6
5
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW16
GW21
GW22
GW23
GW25

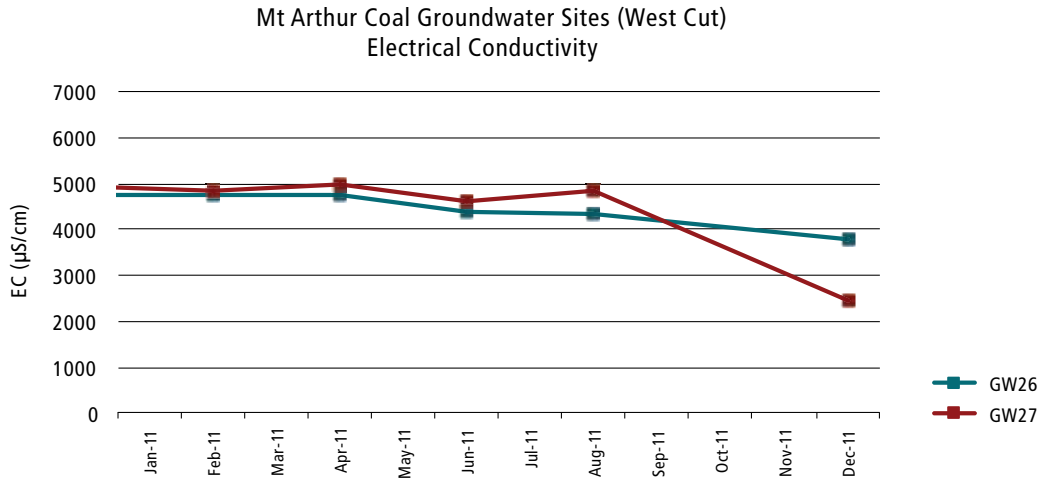

Mt Arthur Coal Groundwater Sites (Hard Rock)
pH
pH
10
9
8
7
6
5
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW6
GW7
GW8
GW13
GW15
GW37


Mt Arthur Coal Groundwater Sites (West Cut)
pH
pH
10
9
8
7
6
5
4
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW26
GW27


Mt Arthur Coal Groundwater Sites (Saddlers Creek Alluvial)
Electrical Conductivity
EC (µS/cm)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW2
GW3


Mt Arthur Coal Groundwater Sites (Hunter River Alluvial)
Electrical Conductivity
EC (µS/cm)
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW16
GW21
GW22
GW23
GW25


Mt Arthur Coal Groundwater Sites (Hard Rock)
Electrical Conductivity
EC (µS/cm)
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW6
GW7
GW8
GW13
GW15
GW37


Mt Arthur Coal Groundwater Sites (West Cut)
Electrical Conductivity
EC (µS/cm)
7000
6000
5000
4000
3000
2000
1000
0
Jan-11
Feb-11
Mar-11
Apr-11
May-11
Jun-11
Jul-11
Aug-11
Sep-11
Oct-11
Nov-11
Dec-11
GW26
GW27

Appendix 8 – Groundwater Drawdown 2011

Appendix 9 – Complaints during 2011

Date and time	From	Issue	Investigation and response to complainant
17/01/2011 12:16 PM	Denman Road	Blast vibration	A complainant placed a call to the community response line stating that a blast had shaken their residence. This call was promptly returned by the Environmental Advisor. The complainant was informed that blast overpressure and ground vibration results for the blast were within acceptable limits. The complainant was offered a copy of the results but this was declined.
27/01/2011 1:27 PM	Antiene	General dust	A complaint was received via fax from a complainant within the Antiene area. The complaint related to noise and dust levels. Two phone calls were made to try and contact the complainant to discuss their concern's further. Messages were left in an attempt to organise a meeting.
31/01/2011 11:35 AM	Denman Road	Blast vibration	A complainant called Mt Arthur Coal to complain about blast vibration. In particular, the complainant emphasized that the blast was unusually long. The Environmental Superintendent explained to the complainant that the blast had been designed to minimise vibration and that the design resulted in longer vibration duration while effectively reducing the strength of vibration. The Environmental Superintendent also informed the complainant that the blast was compliant with regulatory criteria and the complainant did not request to be provided with a copy of monitoring results. Blast monitoring results were compliant with regulatory thresholds. Blast vibration at the monitoring station nearest the resident was 2.91 mm/s and overpressure was 99.4 dBL. Weather conditions were suitable for blasting. Wind speed was 1.8 m/s from the west.
31/01/2011 12:00 PM	Denman Road	Blast vibration	A complainant called the community response line to complain about a blast that was felt at their residence. The Environmental Superintendent returned the complainant's call. Blast results were within statutory limits. At the monitoring station closest to the complainant, blast overpressure was 99.4 dBL and blast vibration was 2.91 mm/s. Weather conditions at the time of the blast were favourable for blasting which were assessed as part of the pre-blast approval process. A copy of the blast monitoring results was offered to the complainant, this was declined.
31/01/2011 5:34 PM	Denman Road	General dust	A complainant called the community response line regarding recent dust levels noted across Denman Road. The complainant was concerned about increasing dust levels during recent weeks. The Environmental Superintendent advised of recent control measures and mining activity within the northern section of the operation. A copy of the monitoring results was offered to the complainant, however, these were declined.
02/02/2011 4:00 PM	Denman Road	General dust	A complaint was received through the community response line to report high levels of dust experienced along Denman Road. The complainant advised there were notable levels of dust from the strong and gusty wind conditions at this time. It was advised that operations were ceased until wind conditions subsided and all available water carts were operating. Monitoring results were offered to the complainant but this was declined. The complainant noted they wished to have their complaint registered as the dust was particularly notable. Meteorological monitoring indicated wind conditions were highly variable at the time and corresponded with a spike in dust levels.
02/02/2011 5:00 PM	Denman Road	General dust	A complainant called the community response line to notify Mt Arthur Coal of high dust levels at the complainant's residence. The Environmental Superintendent contacted the complainant, and the complainant stated that dust levels had temporarily been quite high at the complainant's residence, but that subsequently dust levels had declined and were no longer problematic. The high dust levels were attributable to gusty wind conditions, and mine operations in the Mt Arthur North pit had been suspended until wind gusts subsided. Dust monitoring results were compliant with regulatory requirements.
03/02/2011 8:07 AM	Denman Road	General dust	A complainant called the community response line to report concerns about high levels of dark dust experienced while driving along Denman Road on the previous evening. The complainant felt that this dust was generated from both Mt Arthur Coal and a neighbouring mine. The complainant was informed that there were high, gusty winds at this time and, as a result, operations were ceased until wind conditions subsided. Monitoring results were offered to the complainant, but this was declined.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
04/02/2011 1:05 PM	Roxburgh Road	Blasting dust	A complainant called the community response line to complain about dust from a blast conducted earlier in the day. The Environmental Superintendent contacted the complainant to discuss the complaint. The complainant expressed dissatisfaction that Mt Arthur Coal conducted a blast during ongoing hot dry conditions. However, the complainant also mentioned that the predominant wind direction at the time of the blast would direct dust away from the complainant's residence and into the pit. The Environmental Superintendent offered to provide the complainant with a copy of monitoring results, but the complainant declined. Monitoring results confirmed compliance with regulatory criteria. Weather conditions at the time of the blast were suitable for blasting. Real-time dust monitoring results at the station nearest the complainant were well below regulatory thresholds.
09/02/2011 3:06 PM .	Antiene	Train noise	A complainant sent a fax to Mt Arthur Coal to complain about a blast at 9.20am on 4/2/11 and about train noise. The Environmental Superintendent called the complainant to discuss the complaint. The Environmental Superintendent informed the complainant that Mt Arthur Coal blasted at 12.45pm on 4/2/11, but not at 9.20am. The complainant was confident that blast that impacted their residence occurred prior to 12.45pm, and therefore it was not the Mt Arthur Coal blast that caused the impact. The complainant also stated that train noise had been bad during the previous two week-ends, but the complainant could not recall specific time periods. The Environmental Superintendent suggested that complainant call the community response line when train noise is excessive so that it can be immediately addressed. Attended noise monitoring is conducted quarterly near the complainant's residence, and monitoring was not scheduled for the days relating to the complaint. Consequently, noise monitoring data was not available for analysis for those days.
10/02/2011 12:30 PM	Denman Road	Blast vibration	A complainant called the community response line regarding a blast that was felt at their residence. The Environmental Superintendent returned the complainant's call. The complainant stated that they were outside at the time of the blast and that they could feel the vibration resulting from the blast. The Environmental Superintendent informed the complainant that blast monitoring results were within regulatory limits and offered to provide the complainant with monitoring results, however this was declined. Ground vibration was 4.04 mm/s and overpressure was 101.8 dBL at the blast monitor nearest the complainant. Weather conditions were suitable for blasting. Wind speed was approximately 0.9 m/s from the north west.
02/03/2011 8:13 AM	Denman Road	General dust	A complaint was received from a resident located along Denman Road. The complainant expressed concern regarding the increasing level of dust impacting their property. A secondary issue related to no formal response received following a submission following the Environmental Assessment. Mt Arthur Coal representatives contacted the resident and followed up with a visit to their residence to discuss dust levels and management measures. A copy of the formal response to submissions was provided.
03/03/2011 10:40 AM	Roxburgh Road	Blast vibration	A complainant called Mt Arthur Coal regarding blast vibration and the call was returned by the Environmental Advisor. The complainant described feeling three waves of vibration at 10.30am to 10.40am that prevented him from drinking a glass of water which he was holding at the time. The Environmental Advisor confirmed that Mt Arthur Coal did have a blast at this time. The highest vibration recorded was 0.04 mm/s at the Edinglassie monitor and the highest overpressure recorded was 101.5 dBL at the Antiene monitor. These results were below development consent conditions and were described to the complainant. The complainant also raised concerns about the impacts of blasting to concrete areas and structures on his property from both expansion and from surrounding mines. The Environmental Advisor informed the complainant of baseline structural assessments that would be carried out as a part of the Mt Arthur Coal Mine Open Cut Consolidation Project Approval. The complainant advised that he would like his property to be included in these assessments. This was arranged by the Environmental Advisor and completed in the following weeks.

Date and time	From	Issue	Investigation and response to complainant
05/03/2011 10:11 AM	Hunter Valley	General dust	A complaint was received through the community response line. The complaint related to dust and noise concerns. A Mt Arthur Coal representative attempted on a number of occasions to return the call to discuss the complainant's concerns. The complainant was unable to be contacted.
06/03/2011 8:30 AM	Roxburgh Road	General dust	A complainant called the community response line on Sunday morning. Attempts were made by the Environmental Superintendent to return the call with no success. The complainant then rang Mt Arthur Coal directly on Monday morning. The call was received by the Environmental Advisor. The complainant explained that a large amount of dust had settled on his car over Saturday night leading to a concern about dust levels during this time. The complainant requested dust results from a Mt Arthur Coal real-time dust monitor at Roxburgh Road at this time. The Environmental Advisor noted that this monitor was currently unavailable and was awaiting parts for repairs. The complainant expressed concern that monitoring equipment was often unavailable. The results from the nearby Denman Road West monitor were then reviewed. The complainant was informed that the real-time dust results at this monitor were below consent conditions between 6pm Saturday, 5 March 2011, and 8am Sunday, 6 March 2011, and that the 24 hour average was also below consent conditions. The complainant then raised concerns about adequate response to dust readings. The Environmental Advisor informed the complainant about the real-time response process at Mt Arthur Coal.
11/03/2011 11:18 AM	Muswellbrook	Blast fume	The Department of Planning (DoP) informed the Environmental Superintendent that a community complaint had been received regarding fume from a blast. DoP inquired about the cause of the fume. The Environmental Superintendent and Drill and Blast Superintendent investigated the blast and determined that a moderate amount of fume had resulted from the blast due to wet conditions. The Environmental Superintendent informed DoP of the cause, and DoP informed the complainant. Weather conditions were suitable for blasting at the time of the blast. Wind speed was approximately 2.5 m/s and wind direction was from the southwest.
12/03/2011 10:32 PM	Castle Rock Road	Operational noise	A complainant called the community response line to advise that there was noise 'permeating through the house'. Upon receiving the complaint, the Open Cut Examiner was contacted to discuss current operations. Mining locations had not changed significantly over the past three weeks. Weather conditions were very calm and still. The Open Cut Examiner advised that earlier in the night, all trucks had been moved to lower dumps, and that nothing was dumping high. Also, the shovels and excavators being used in northern pits were low in the pit. This was explained to the complainant. No further action required.
16/03/2011 11:18 AM	Denman Road	Blast vibration	A complainant called the community response line to complain about a blast, and Environmental Superintendent returned the complainant's call. Complainant stated that the blast had caused their home to shake. All monitoring results were within statutory limits. The results at the blast monitor nearest the resident were 0.46 mm/s for blast vibration and 74.7 dBL for blast overpressure. Weather conditions were favourable for blasting. Wind speed was 1.7 m/s and wind direction was from the west. Environmental Superintendent offered to provide monitoring results, but this was declined.
19/03/2011 9:50 AM	Castle Rock Road	Operational noise	The complainant called the community response line regarding operational noise, and Environmental Superintendent returned complainant's call. The complainant stated they could hear operational noise from Mt Arthur Coal from approximately 8.00-9.00am. The complainant also stated that the noise was not loud or bothersome, but they called because they felt that operational noise from Mt Arthur Coal should be inaudible at their residence. The Environmental Superintendent offered to provide monitoring results, but the complainant declined. The Environmental Superintendent called the Open Cut Examiner and informed them of complaint. The Open Cut Examiner undertook review of operations to ensure noise levels were minimised. Weather conditions at the time of the complaint were suitable for mine operations. Wind speed was approximately 1 m/s and wind direction was from the east. Noise levels at the monitor nearest the complainant were within regulatory criteria during the time period associated with the complaint, ranging from approximately 21 dBA to 36 dBA.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
23/03/2011 11:00 AM	Skeletar Stock Route/ TMD	Blasting dust	The complainant called the community response line to register concern about blast vibration and plume from a blast that morning. The call was promptly returned by the Environmental Advisor who explained that vibration results had not yet been received. The complainant requested that these results be posted when they became available. This was completed by the Environmental Advisor. The complainant noted that the vibration could be felt over a long period in separate sections, where the vibration subsided and then returned. The Environmental Advisor explained that this was due to the use of electronic detonation which segmented the shot to reduce vibration levels. The impacts of water from rain on blast fumes was also discussed, as was the practice of firing in suitable environmental conditions to minimise impacts from dust and fume. The Environmental Advisor explained that the blast seen was likely to be over the active mining area, rather than over residential land, as a result of this practice.
23/03/2011 11:16 AM	Denman Road	Blast vibration	A complainant called the community response line regarding blast vibration. The complainant expressed concern that blast vibration lasted longer than usual. The Environmental Superintendent explained that new technology was being applied to reduce blast vibration, and that the technology resulted in longer blast duration. The Environmental Superintendent offered to provide the complainant with a copy of blast monitoring results, but the complainant declined. Monitoring results were within regulatory criteria. The blast monitor nearest the complainant recorded a vibration of 0.13 mm/s and overpressure of 98.2 dBL. Weather conditions were suitable for blasting. Wind speed was approximately 5.5 m/s and wind direction was from the west.
30/03/2011 3:40 PM	Denman Road	Blast vibration	The complainant called the community response line to report blast vibration felt at their residence. The complainant reported that the impacts were enough to wake her sleeping child. Monitoring results were below development consent conditions and were offered to the complainant but these were declined.
02/04/2011 3:54 PM	Denman Road	General dust	A complaint was received from a resident along Denman Road relating to general dust levels visible at the operation. The complainant was contacted to discuss concerns and current conditions. The Open Cut Examiner was contacted to ensure operations were modified accordingly and ensure all available water carts were utilised. Dry conditions and a change in wind conditions were noted during the afternoon which contributed to an increase in real time monitoring levels at the Denman Road West monitor.
18/04/2011 8:30 AM	Roxburgh Road	Operational noise	A complainant called community response line to register a complaint regarding operational noise. The Environmental Superintendent called the complainant to discuss complaint. The complainant stated that operational noise was audible outdoors at the complainant's residence. The Environmental Superintendent committed to contact the Open Cut Examiner and request a review of operations to ensure noise is managed effectively. The Environmental Superintendent offered to call the complainant later in the morning to confirm that noise levels had diminished, but the complainant declined a follow-up phone call. The Environmental Superintendent contacted the Open Cut Examiner and requested a review of operations to minimise noise and the Open Cut Examiner fulfilled the request. Noise monitoring results were compliant with regulatory requirements. Weather conditions fluctuated during the time period associated with the complaint, with wind direction shifting from east to west and wind speeds varying from 0.2 to 4.7 m/s.

Date and time	From	Issue	Investigation and response to complainant
18/04/2011 10:30 AM	Roxburgh Road	Operational noise	A complainant called the community response line to register a complaint regarding operational noise. The Environmental Superintendent called the complainant to get additional information. The complainant stated that mine noise was audible at the complainant's residence. The Environmental Superintendent committed to contact the Open Cut Examiner and request a review of operations to ensure noise is managed effectively. The Environmental Superintendent contacted the Open Cut Examiner and requested a review of operations to minimise noise and the Open Cut Examiner fulfilled the request. The Environmental Superintendent followed-up with a phone call to the complainant to verify noise levels had diminished. The complainant did not answer the phone, so the Environmental Superintendent left a message with contact details so the complainant could contact Environmental Superintendent directly with any additional issues related to the noise complaint. Noise monitoring results were compliant with regulatory requirements. Weather conditions fluctuated during the time period associated with the complaint, with wind direction shifting from east to west and wind speeds varying from 0.2 to 4.7 m/s.
19/04/2011 1:35 PM	Muswellbrook	Blast fume	A complainant contacted the community response line to report an orange plume. The Environmental Superintendent called the complainant, and the complainant stated that an orange plume at Mt Arthur Coal was visible from South Muswellbrook. The complainant asked for wind speed and direction at the time of the blast responsible for the orange plume, and the Environmental Superintendent provided the requested information. Wind speed at the time of the blast was approximately 0.6 m/s from the north west.
19/04/2011 1:40 PM	Roxburgh Road	Blast fume	A complaint was received through the community response line in relation to blast fume at a Roxburgh Road residence from a blast at approximately 1.20pm. The Environmental Advisor confirmed that Mt Arthur Coal blasted at this time. The Environmental Advisor also noted that wind results at this time indicated that the wind direction was from the north west, away from the residence concerned. The complainant requested wind monitoring results as well as further information on the blast, which was provided.
24/04/2011 5:30 AM	Roxburgh Road	Operational noise	A complainant contacted community response line to report noise impact. The Environmental Superintendent called the complainant to acquire further detail. The complainant stated that mine operational noise was audible at their residence. The Environmental Superintendent contacted the Open Cut Examiner who reviewed operations to ensure noise was managed appropriately. The Environmental Superintendent then called complainant to verify that noise impacts had been mitigated. The complainant confirmed that noise impacts had been mitigated. Noise levels were below statutory limits at the time. Wind conditions were variable during the time period associated with the complaint. Wind speed varied from approximately 0.2 to 3.0 m/s and wind direction was predominantly from the east.
25/04/2011 5:23 PM	Roxburgh Road	Operational noise	A complaint was received from Roxburgh Road regarding noise from the mine site during the night of 24 April and early morning of 25 April. The complainant advised of a general 'machinery hum' coming from the direction of Mt Arthur Coal. Monitoring indicated that Mt Arthur Coal was below development consent conditions on this night.
01/05/2011 9:00 AM	Castle Rock Road	Operational noise	A complaint was received from Castle Rock Road regarding noise from the mine site on the morning of 1 May 2011. The complainant advised of general noise coming from multiple mine sites but believed the wind direction to their property appeared to be coming from Mt Arthur Coal. Wind direction was recorded to be coming from a westerly direction at time of the complaint. Monitoring results indicated that Mt Arthur Coal was operating within consent conditions.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
02/05/2011 12:46 PM	Roxburgh Road	Blasting dust	A complaint was received through the community response line from a Roxburgh Road resident about dust from a blast in Windmill Pit. The call was returned by the Environmental Advisor who noted that the wind conditions recorded at the time of the blast were from the west-north-west, away from the resident's property. The Environmental Advisor also informed the complainant that employees at Mt Arthur Coal at the time of the blast confirmed that they could see the dust from the blast move away from the direction of the complainant's residence and into the pit. The complainant assured the Environmental Advisor that the dust was from a Mt Arthur Coal blast because they felt the blast just before the dust blew in. The Environmental Advisor noted that real-time dust results from the monitor closest to the complainant's property were below statutory limits. The complainant requested monitoring results for wind, blast design and real-time dust be forwarded to him. This was arranged by the Environmental Advisor.
02/05/2011 3:46 PM	Hunter Valley	Blast vibration	A complaint was received through the community response line regarding blast vibration felt at a residence in Wybong. The Environmental Advisor returned the call shortly after but there was no answer. A call was received later that day from a Department of Planning compliance officer in relation to this complaint. Blast results for both vibration and overpressure were confirmed to be below statutory limits and results were sent to the compliance officer confirming this. The complainant was then called by the environmental advisor. The complainant confirmed that they felt their floor and windows shake from a blast at 12.35pm. The Environmental Advisor confirmed that two blasts were undertaken close to this time and that results for both were under statutory limits. Monitoring results were offered to the complainant but these were declined. The complainant also noted that dust levels at their residence increased when mining began in Mt Arthur North. The Environmental Advisor explained that Mt Arthur Coal operated consistently under statutory limits for dust. The complainant agreed that this was satisfactory practice but noted that they felt that the limits were not adequate.
03/05/2011 11:20 AM	South Muswellbrook	Operational noise	A complainant called Mt Arthur Coal staff directly to report a noise complaint. The Environmental Superintendent returned complainant's call. The complainant reported that noise from Mt Arthur Coal operations had been audible between 7.30 and 8.30am that morning. The complainant inquired whether Mt Arthur Coal had exceeded its noise limits. Noise monitoring results were not available at the time of the conversation. The Environmental Superintendent offered to provide a copy of noise monitoring results to complainant. The complainant accepted the offer and also requested monitoring results from 22 March 2011. Monitoring results from 22 March 2011 were provided immediately. Monitoring results from 3 May 2011 were provided when they became available on 6 May 2011. Monitoring results confirmed compliance with regulatory criteria during the time period associated with the complaint. Although the noise level at 8.30am on 3 May 2011 exceeded the regulatory limit of 39 dBL, an analysis of the audio files revealed that the primary noise source was machinery operating in close proximity to the noise monitor which was not associated with Mt Arthur Coal operations. Weather conditions were suitable for mine operations during the time period associated with the complaint. Wind speed ranged from 1.3 to 2.2 m/s and wind direction was from the north west.
04/05/2011 11:18 AM	Roxburgh Road	Blast vibration	A complaint was received from Roxburgh Road regarding vibration from a blast. Two blasts were fired at the time concerned. Blast overpressure and vibration results for both blasts were within statutory limits. The Environmental Advisor offered monitoring results to the complainant but these were declined.
06/05/2011 8:00 AM	South Muswellbrook	Operational noise	A complaint was received from resident at Wollombi Road, South Muswellbrook, regarding operational noise throughout the night and early morning. The complainant described hearing trucks running and dozer tracks from the direction of Mt Arthur Coal. The Environmental Advisor discussed noise monitoring practices and actions taken during the night by Open Cut Examiners to reduce noise levels in response to alerts received from a noise monitor to the west of the operation. The impacts of temperature inversions on noise levels in the cooler months of the year was also discussed. Monitoring results at the Sheppard Avenue noise monitor, nearest the resident, were below statutory limits throughout the time concerned.

Date and time	From	Issue	Investigation and response to complainant
06/05/2011 12:29 PM	Antiene	General dust	A complaint was received by fax from a resident located in the Antiene area relating to general dust levels and a blast on the 4 May 2011. The complainant was contacted to discuss their concerns. A subsequent visit was undertaken to have a face to face meeting with the community member, with a structural inspection also undertaken on the resident's property.
11/05/2011 11:38 AM	Denman Road	Blast vibration	A complaint was received from a Denman Road resident regarding blast vibration from a blast in Windmill Pit. Monitoring results for vibration and overpressure were below statutory limits.
12/05/2011 11:35 AM	Racecourse Road	Blast vibration	Sheppard Avenue resident called to complain about blast vibration from a blast in Windmill Pit. The complainant described feeling the windows and floor of her house shake and was concerned about damage to her house from blasting. Monitoring results were below statutory limits for the blast concerned.
12/05/2011 11:40 AM	Roxburgh Road	Blast vibration	A complaint was received through the community response line from a resident on Roxburgh Road relating to a blast in the Windmill Pit area. Attempts were made to contact the complainant by phone on three occasions. A letter was subsequently posted with monitoring details from the blast together with contact details for Mt Arthur Coal. Monitoring results at the Denman Road West blast monitor located closest to the resident indicated results were within the statutory limits for ground vibration and overpressure.
18/05/2011 10:02 PM	Roxburgh Road	Operational noise	A complainant called community response line and the Environmental Superintendent returned the complainant's call. The complainant stated that operational noise had been audible at their residence, particularly noise from dozers and trucks. However, the complainant stated that the noise had ceased soon after they called the community response line. The Environmental Superintendent contacted the Open Cut Examiner who confirmed that equipment had been moved soon after the complainant's call. Noise monitoring results were below regulatory limits during the time period associated with the complaint with the exception of one reading. An analysis of the associated audio file revealed that this reading was attributable to traffic noise and not mining operations. Weather conditions were suitable for mine operations at the time of the complaint. Wind speed was approximately 3.5 m/s and wind direction was from the east.
19/05/2011 5:38 PM	Roxburgh Road	General dust	A complainant from Roxburgh Road called regarding dust at their residence. The Environment and Community Manager attempted to return the call but was unable to contact the complainant on the day of the complaint. The complainant was contacted the following day. Monitoring results were within allowable limits.
22/06/2011 2:00 PM	Hunter Valley	Blast vibration	The Environment Advisor received a phone call from a Bengalla Road resident who reported that their house shook due to a blast at 1.55pm. This time corresponded with a blast at Mt Arthur Coal. Blast monitoring results were within statutory limits. The complainant did not request a copy of the results.
22/06/2011 2:02 PM	Denman Road	Blast vibration	Complainant contacted the community response line to register a complaint, and the Environmental Superintendent returned the complainant's call. The complainant stated that the blast caused the their residence to shake. The Environmental Superintendent informed the complainant that blast monitoring results were below statutory limits. The complainant requested a copy of the blast monitoring results. This was sent to the complainant. The Environmental Superintendent informed the Drill and Blast Superintendent of the complaint to ensure the complainant's feedback is accounted for in the design of future blasts. Monitoring results were below statutory limits. Results from the monitor nearest the blast were 114.0 dB for overpressure and 2.61 mm/s for vibration. Weather conditions were suitable for blasting activities. Wind speed was 8.8 m/s and wind direction was from the west south west.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
01/07/2011 7:56 AM	Roxburgh Road	Operational noise	A complaint was received from a resident on Roxburgh Road in relation to noise levels from the previous night between 11pm and 3am. Noise levels during the night were within statutory limits at the real time noise monitor between the mine and the complainant's residence. Mining noise could be heard when audio from the closest monitor was reviewed during the hours of concern. It was noted by the complainant that noise was generally received at the property from multiple sources. The Environmental Advisor confirmed that monitoring would be carried out at the property during the following weeks to obtain site specific data to assist in determining impact.
04/07/2011 12:00 PM	Denman Road	Lighting	A complainant called to report that two lights from Mt Arthur Coal were shining on Denman Road the previous night at approximately 10pm, impacting the vision of drivers on the road. The Environmental Advisor informed the complainant that the Open Cut Examiners would be notified to relocate the lights so that this did not reoccur.
13/07/2011 9:24 PM	Edderton Road	Lighting	A complainant called regarding lights shining onto Edderton Road from the general direction of Mt Arthur North. The Environment and Community Manager returned the call. The complainant gave a good description of where they saw lights shining onto the road, and expressly stated that they wished the call to be logged as a complaint. The Open Cut Examiner was contacted and immediately went out to Edderton Road to investigate. Lights from two work areas were moved in order to minimise light spill from the area.
18/07/2011 1:59 PM	Denman Road	Blast vibration	A complainant contacted the community response line and the Environmental Superintendent returned complainant's call. The complainant stated that blast vibration caused their house to shake and that they could hear the blast. The complainant requested that blast monitoring results be provided. The Environmental Superintendent sent monitoring results to the complainant. Blast monitoring results were below regulatory criteria at the monitor closest to the complainant's residence. Blast overpressure was 97.5 dBL and vibration was 3.57 mm/s. Weather conditions were assessed during the pre blast inspection as suitable for blasting. Wind speed was 8.7 m/s and wind direction was from the west.
22/07/2011 3:27 PM	Hunter Valley	General dust	A complaint was forwarded to Mt Arthur Coal from the Department Trade, Investment, Regional Infrastructure and Services. The Department had received a complaint from a community member relating to general dust management and a blasting plume on Friday 8 July. No name or contact details were provided by the complainant to enable further details to be confirmed relating to the complaint. Mt Arthur Coal did not blast on 8 July. Details related to Mt Arthur Coal's dust control practices and monitoring results were provided to the representative at the Department. Real time air quality monitoring indicated that Mt Arthur Coal was within regulatory requirements.
31/07/2011 9:15 PM	Roxburgh Road	Lighting	A Roxburgh Road resident placed a call to the community response line to request that a light be moved that was shining into their residence. The Environmental Coordinator immediately contacted an Open Cut Examiner and requested that the offending light be reoriented away from the residence and other off-site areas. The Open Cut Examiner carried out this request promptly.
05/08/2011 11:05 AM	Denman Road	Other environmental	A complaint was received from a Denman resident who was stopped on Denman Road because of a road closure for a Mt Arthur Coal blast. The complainant noted that they had been stopped for approximately five minutes and a long line of traffic was developing. The Environmental Coordinator apologised for the inconvenience and informed the complainant that an SMS text message had been sent to the complainant's phone number earlier that morning to notify them of the scheduled blast and road closure, as agreed. The complainant had not read the text prior to being stopped at the road closure. The complainant also expressed concern that the practice of mines closing roads was an accepted practice in the local area. The Drill and Blast team were contacted immediately following the call and confirmed that the road had been re-opened. The road had been closed for approximately 10 minutes. The complainant was contacted the following week and it was arranged for them to be sent weekly blast schedules that include notifications of road closures. In addition, the complainant was informed of the MSC webpage for upcoming road closures and the availability of Mt Arthur Coal blast schedules on the BHP Billiton website.

Date and time	From	Issue	Investigation and response to complainant
08/08/2011 11:05 AM	Denman Road	Blast vibration	A Denman Road resident called the community response line to register a complaint about blast vibration. Results at the monitor closest to the resident were higher than typical for this blast, due to the proximity and nature of the particular shot. All monitoring results for the blast were below statutory limits.
08/08/2011 11:10 AM	Roxburgh Road	Blast vibration	A complaint was received through the community response line relating to blast vibration experienced at the complainant's residence along Roxburgh Road. The blast was within the Huon Pit area and weather conditions and blast design were suitable for the location of the blast. Results were provided over the phone. A copy of the results was offered by Mt Arthur Coal and no further details or actions were requested by the complainant.
10/08/2011 11:18 AM	Denman Road	Blast vibration	A complaint was received from a Denman Road resident regarding vibration from a blast in Windmill Pit. Monitoring results for vibration and overpressure were below statutory limits. A copy of the results were offered to the complainant, which was declined.
12/08/2011 10:00 PM	Roxburgh Road	Operational noise	A complaint was received from a Roxburgh Road resident regarding a constant noise that was preventing the complainant from sleeping. The complainant described the noise as a constant 'boom boom'. The Environment and Community Manager contacted the Open Cut Examiners who confirmed that activities were being undertaken in low lying areas in the northern part of the operations, closest to the resident. Monitoring results were below regulatory limits. Noise levels were approximately 22 dBA at the time of the complaint. Temperature was approximately 11.2 degrees Celsius, with no rain, 79 per cent humidity and a wind speed of 0.64 m/s from the south south east. The open cut examiners monitored noise levels throughout the remainder of the night. Noise levels remained under regulatory limits.
13/08/2011 7:00 AM	Roxburgh Road	Operational noise	A complaint was received from a Roxburgh Road resident regarding a constant pulsating noise. The Environment and Community Manager contacted the Open Cut Examiners who confirmed that mining activities were extremely limited due to fog. Monitoring results were below regulatory limits. Weather conditions were cool and calm. Environment and Community Manager advised complainant that mining activities were extremely limited in the northern end of the operations due to fog and confirmed that noise monitoring results were below regulatory limits.
14/08/2011 7:08 AM	Roxburgh Road	Operational noise	A complaint was received from a Roxburgh Road resident regarding a constant pulsating noise. The complainant stated that it could be heard all day on the 13 August 2011 and the noise was worse than it had been previously. The complainant had also contacted a neighbouring mine because of uncertainty about where the noise was coming from. Monitoring results were below regulatory limits. Noise levels were approximately 38 dBA at the time of the complaint. Temperature was approximately 6.8 degrees Celsius, no rain, 94 per cent humidity and a wind speed of 1.3 m/s from north north west. The Environment and Community Manager confirmed that noise monitoring results were below regulatory limits.
15/08/2011 8:37 AM	Roxburgh Road	Operational noise	A complaint was received from a Roxburgh Road resident regarding a constant noise. The Environment and Community Manager visited the resident and found that while mining noise was audible at times the noise levels were very low and difficult to hear. Monitoring results were below regulatory limits. Noise levels were approximately 15 dBA at the time of the complaint. Temperature was approximately 8.4 degrees Celsius, no rain, 95 per cent humidity and a wind speed of 1.4 m/s from the north north west. During the visit, the Environment and Community Manager discussed noise levels over the weekend, informing the complainant that all equipment had been shut down on the morning of Saturday 13 August 2011. Noise monitoring had recently been carried out on the complainant's property. The expected time frame for the report to be completed for this monitoring was discussed.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
15/08/2011 10:00 PM	Roxburgh Road	Operational noise	A community member contacted the community response line to complain about operational noise. The complainant requested that a Mt Arthur Coal representative visit their residence, and the Environmental Superintendent visited the complainant at their residence. The complainant stated that mine operational noise was affecting their sleep. The Environmental Superintendent called the Open Cut Examiner and requested that they review operations for noise impacts. The Open Cut Examiner reviewed operations and confirmed that no excessive noise was generated. The Environmental Superintendent also confirmed for the complainant that noise monitoring results were well below regulatory criteria. Weather conditions were cool with a slight easterly breeze. Monitoring results were well below regulatory criteria. Noise levels at the time of the complaint ranged from 18 to 20 dBA. Weather conditions at the time of the complaint were suitable for mine operations. Wind speed was approximately 3 m/s and wind direction was from the east.
17/08/2011 12:07 PM	Denman Road	Blast vibration	A complaint was received from a resident on Denman Road regarding blast vibration. The complainant stated that vibration from the blast caused windows on their home to shake and that the resulting noise woke the complainant. The Environmental Superintendent confirmed for the complainant that blast results were below regulatory criteria. Blast overpressure was 103.47 dB and vibration was 0.66 mm/s. Weather conditions were suitable for blasting. Wind speed was 0.9 m/s and wind direction was from the east.
17/08/2011 1:11 PM	Roxburgh Road	Operational noise	A community member contacted the community response line to register a complaint regarding noise. The Environmental Superintendent contacted the complainant to get additional detail. The complainant stated that mine operational noise was loud at their residence. The Environmental Superintendent informed the complainant that due to wet weather there was little activity in the pit. The Environmental Superintendent also confirmed for the complainant that noise levels were well below regulatory limits. At the time of the complaint there was rainfall. Wind speed was less than 1 m/s and was generally from the east.
19/08/2011 11:15 AM	Denman Road	Blast vibration	A community member contacted the community response line to complain about blast vibration. The complainant informed the Environmental Superintendent that vibration from a blast caused their residence to shake. The Environmental Superintendent confirmed that blast monitoring results were within regulatory criteria. At the monitor nearest the complainant, blast overpressure was 108.2 dBL and blast vibration was 0.23 mm/s. Weather conditions were suitable for blasting. At the time of the blast, wind speed was approximately 5 m/s and wind direction was from the west.
22/08/2011 1:33 AM	Roxburgh Road	Operational noise	The complainant contacted the community response line regarding mine operational noise. The complainant requested that Mt Arthur Coal personnel not contact them until the next morning. The Environmental Coordinator contacted an Open Cut Examiner and asked them to review operations for noise. After reviewing operations, the Open Cut Examiner stated that there was no equipment causing high noise levels. The Environmental Superintendent contacted another Open Cut Examiner who stated that operations had been limited during the night due to prevailing wet conditions. The Environmental Superintendent called the complainant in the morning as requested. The complainant stated that mine operational noise had disturbed their sleep. The Environmental Superintendent confirmed that noise monitoring results were below regulatory limits.
23/08/2011 10:52 AM	Denman	Lighting	A resident near the township of Denman called Mt Arthur Coal directly to register a complaint about light from Mt Arthur Coal that had been shining towards their residence on 22 August 2011. The Environmental Coordinator was absent on the day of the call. The complainant left a phone message which was returned by the Environmental Coordinator the following day. The complainant confirmed that the offending light had since been moved and was no longer shining towards their residence. The Environmental Coordinator informed the complainant of the 24 hour community response line number so that any lighting issues could be addressed promptly in the future.

Date and time	From	Issue	Investigation and response to complainant
24/08/2011 2:12 AM	Roxburgh Road	Operational noise	A community member contacted the community response line to register a complaint regarding noise. The complainant requested not to be called back that night. The Environmental Coordinator called Open Cut Examiner at the time of complaint. The Open cut examiner advised that dumping was being undertaken in low lying areas within the pit and there had been no change to the machinery that had been operating all night. The Environmental Coordinator rang the complainant back the following day to get additional detail. The complainant stated that the noise started around 9pm and continued into the night and the following morning. Monitoring results were below regulatory limits and the weather conditions were cool with a slight easterly breeze.
26/08/2011 1:27 AM	Roxburgh Road	Operational noise	A community member contacted the community response line to register a complaint regarding noise. The Environmental Coordinator called the complainant to get additional details. The Complainant stated that the noise was a loud humming noise that was creating vibrations through the house. The Environmental Coordinator advised that they would call the Open Cut Examiner to assess the operations and informed the complainant that they would call back later in the day after reviewing the real time noise monitoring results. The Environmental Coordinator called the Open Cut Examiner. The Open Cut Examiner who advised that dumping was being undertaken in low lying areas, there had been no change to the machinery from the previous night and there had been no noise alarms received prior to the complaint. Monitoring results were below regulatory limits. Noise levels were approximately 34 dBA at the time of the complaint. Temperature was approximately 7.6 degrees Celsius, no rain, 81 per cent humidity with a wind speed of 2.1 m/s from the north east. The Environmental Coordinator rang the complainant back at approximately 10.30am and advised that the noise monitoring results were below regulatory limits. Complainant stated that they could still hear the humming noise. The Environmental Coordinator arranged to visit the complainant's residence that day to listen to the noise.
30/08/2011 6:10 AM	Roxburgh Road	Operational noise	The complainant contacted the community response line to register a complaint regarding mine operational noise that they had heard throughout the night since 1am. The Community Relations Coordinator immediately phoned complainant who advised that they hadn't been able to sleep since 1am due to mine operational noise that sounded like constant pulsating which they believed was coming from Mt Arthur Coal. The Community Relations Coordinator contacted the Open Cut Examiner who confirmed that they had been dumping low throughout the night. The Community Relations Coordinator contacted the complainant the following evening to discuss findings and also committed to arranging a temporary noise monitor to be located at their property for a limited time in an attempt to better understand their noise concerns. Noise monitoring results were below regulatory limits. Weather conditions were suitable for mining operations.
05/09/2011 11:30 AM	Denman Road	Blast vibration	A community member contacted the community response line to register a complaint regarding blast vibration. The Environmental Coordinator returned the complainant's call. The complainant stated they felt two lots of vibration through their house and noticed that the vibration lasted for a longer period of time than usual. The Environmental Coordinator confirmed that blast monitoring results were below regulatory criteria. Blast overpressure was 105.01 dB and vibration was 0.33 mm/s at the nearest blast monitor (Yammanie – BP06). The blast utilised an electronic detonation technique that minimises blast vibration and can be felt for a longer period of time than other blasts. Temperature was 19.5 degrees, humidity 45 per cent and wind speed was 1.3 m/s from the west.
05/09/2011 11:30 AM	Denman Road	Blast vibration	A community member contacted the community response line to register a complaint regarding blast vibration and dust from a blast in Windmill Pit at 11.26am. The Environmental Coordinator returned the complainant's call. The complainant stated that they felt the house shake and noticed an orange plume of dust following the blast. The Environmental Coordinator confirmed that blast monitoring results were below regulatory criteria. Blast overpressure was 105.84 dB and vibration was 4.15 mm/s at the nearest blast monitor (Denman Road West). The real time dust result at the nearest dust monitor (Denman Road West – DC01) was 8 $\mu g/m^3$. Temperature was 19.5 degrees, humidity 45 per cent and wind speed was 1.3 m/s from the west. These wind conditions resulted in the orange plume dissipating without leaving site. The complainant requested a copy of the blast monitoring results, which were sent to the complainant later that day.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
05/09/2011 11:33 AM	Roxburgh Road	Blast vibration	A Roxburgh Road resident called the community response line to register a complaint about vibration from a blast that shook their house. The Environmental Advisor returned the complainant's call and informed the complainant that all blast monitoring results were below statutory limits. The Environmental Advisor also noted that the vibration results at the monitor closest to the resident were higher than would be typically experienced due to the size and location of the blast. The complainant expressed concern that monitoring results at the closest monitor may not reflect the vibration at their residence due to differences in geology. The Environmental Advisor advised the complainant that the placement of a temporary blast monitor in the Roxburgh Road area was currently being investigated. The complainant requested a copy of the blast monitoring results, which were posted to the complainant. The complainant also registered a complaint about high dust levels over the previous few days. All real-time dust results were below statutory limits during this time.
05/09/2011 11:21 PM	Roxburgh Road	Operational noise	The complainant contacted the community response line to register a complaint regarding mine operational noise that was affecting their sleep. The complainant requested that they not be contacted until the following day. The Community Relations Coordinator immediately phoned the Open Cut Examiner who committed to modifying operations to dump lower. The Community Relations Coordinator contacted the complainant the following day to discuss the complaint, the Open Cut Examiner's response and to confirm that noise monitoring results were within regulatory limits. The complainant commented that the noise was constant and they were finding it difficult to block out the low frequency pulsating noise they heard and were finding it difficult to sleep. The complainant commented that they had also registered a complaint with another neighbouring mine as they could not identify which mine the noise was coming from. The Community Relations Coordinator again confirmed with the complainant that the temporary noise monitoring would be set-up at their property during the week, at which point they could discuss their noise concerns further. Noise monitoring (Denman Road West) was below regulatory limits. Weather was suitable for operations. At the time of the complaint temperature was 13.6 degrees, 69% humidity, no rainfall was recorded and wind speed was north west at 1.8 m/s.
12/09/2011 9:30 AM	Roxburgh Road	General dust	The complainant called the Environmental Superintendent to register a complaint about the accumulation of dust at their residence. The complainant stated that dust had accumulated outdoors on the roof of their residence, on their vehicle, and inside their residence. The Environmental Superintendent confirmed that air quality monitoring results were below regulatory criteria at the monitoring station nearest the complainant. The Environmental Superintendent conveyed the complainant's concerns to the Acting Manager Environment and Community and followed up with the complainant later in the week. The depositional dust monitoring results at the monitor closest to the complainant's residence was 0.9 grams / square metre / month for September 2011, below the statutory limit of 4 grams / square metre / month .
15/09/2011 4:00 PM	Denman Road	Blast vibration	A Denman Road resident called the community response line to register a complaint about blast vibration that was felt at their residence. The Environmental Coordinator contacted the complainant. The Environmental Coordinator informed the complainant that the vibration and overpressure results from the blast concerned were within statutory limits. Overpressure was recorded as 107.5 dB and vibration as 0.37 mm/s at the monitor closest to the residence.

Date and time	From	Issue	Investigation and response to complainant
26/09/2011 11:05 AM	Thomas Mitchell Drive	Blast vibration	A community stakeholder contacted the community response line to notify Mt Arthur Coal of a blast they had felt. The stakeholder noted that the vibration from the blast had shaken the building of their business premises quite violently for approximately four seconds. The stakeholder commented that they just wanted to notify and register this event with Mt Arthur Coal as it was the most vibration they had felt in 15 years of being at the premises located in the nearby industrial estate. The Community Relations Coordinator immediately contacted the community stakeholder to discuss their concern. The Community Relations Coordinator confirmed that a blast had occurred in Calool pit and that blast monitoring results were under the regulatory limit, including the nearest Yammanie monitor which recorded 0.24 mm/s. Weather conditions were suitable for blasting. Temperature was 14.8 degrees. Wind speed was east south east at 7.6 m/s and no rainfall was recorded.
26/09/2011 11:15 AM	Denman Road	Blast vibration	The complainant contacted the community response line to register a complaint regarding blast vibration. The Environmental Superintendent called the complainant who stated that the vibration from a blast caused their residence to shake. The Environmental Superintendent confirmed for the complainant that blast results were below regulatory criteria. Blast overpressure was 107.76 dB and blast vibration was 0.24 mm/s. Weather conditions were suitable for blasting at the time of the blast. Wind speed was approximately 6 m/s and wind direction was from the south east.
05/10/2011 12:02 PM	Roxburgh Road	Blast vibration	A community member contacted Mt Arthur Coal to register a complaint regarding blast vibration and fume from a blast at 12.02pm. The complainant called Mt Arthur Coal directly and alerted the Environmental Superintendent that the community response line was not operating. The complainant spoke with the Environmental Superintendent and raised concern over the vibration and fume from the blast. Blast monitoring results were below regulatory criteria. Blast overpressure was 109.35 dB and vibration was 4.15 mm/s at the nearest blast monitor (Denman Road West). Temperature was 15.8 degrees Celsius, humidity was 52 per cent and wind speed was 2.1 m/s from the south east. Mt Arthur Coal investigated why the community response line was not operational and the line was repaired. The complainant rang back the same day and spoke with the Environmental Coordinator and requested a copy of the blast monitoring results, which were sent to the complainant the following day.
06/10/2011 10:37 AM	Denman Road	Blast vibration	A community member contacted the community response line to register a complaint regarding blast vibration from CAc1951-T blast in Calool pit at 10.37am. The Environmental Coordinator returned the complainant's call. Blast monitoring results were below regulatory criteria. Blast overpressure was 94.26 dB and vibration was 0.08 mm/s at the nearest blast monitor. Temperature was 14.5 degrees Celsius, humidity was 79 per cent and wind speed was 0.95 m/s from the south west.
13/10/2011 9:00 PM	Roxburgh Road	Lighting	A complaint was received from a Roxburgh Road resident regarding light from Mt Arthur Coal. The Community Superintendent returned the complainant's call and then contacted the Open Cut Examiners regarding vicinity of light in question. The Open Cut Examiners attempted to point lights downward in the potential area of concern. The Superintendent then called the complainant to verify that the problem was solved, but the call was not answered. The following day the Superintendent asked the Chief Surveyor to visit the complainant's residence to ascertain topography etc, to help determine where the group of lights were positioned at Mt Arthur Coal in relation to the residence. The potential lights were then identified and communication sent to all Open Cut Examiners to be aware of the issue and observe light positions, particularly in a due west direction. The Community Superintendent phoned the complainant the following night to understand if lighting was still an issue. The complainant advised that there was no impact at all coming from the mine site in relation to lighting.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
14/10/2011 1:27 PM	Roxburgh Road	Blast fume	A community member contacted the community response line to register a complaint regarding blast fume from a blast at 1.19pm. The Superintendent Community Relations returned the complainant's call and acknowledged that the blast fume was visible as it left the mine site following the blast. The Superintendent also confirmed that blast vibration and overpressure results were below regulatory criteria and that the Environmental Coordinator would forward these results over the coming days, which was done. An internal investigation was undertaken, and this event was also reported to the Office of Environment and Heritage. Investigation outcomes were reported back to the complainant at the completion of the investigation.
14/10/2011 1:47 PM	Roxburgh Road	Blast fume	A community member contacted the community response line to register a complaint regarding blast fume and dust from a blast at 1.19pm. The Environmental Coordinator returned the complainant's call. The complainant stated that blast fume came on to their property. The Environmental Coordinator confirmed that blast monitoring results were below regulatory criteria and acknowledged that fume was observed leaving the mine site following the blast. An internal investigation was undertaken, and this event was also reported to the Office of Environment and Heritage. Investigation outcomes were reported back to the complainant at the completion of the investigation.
20/10/2011 11:14 AM	Denman Road	Blast vibration	A complainant called the Environmental Coordinator directly to register a complaint about blast vibration. The Environmental Coordinator informed the complainant that the blast concerned was in an area of the Mt Arthur Coal mine that was closer than typical to the complainant's residence and that electronic detonation was used to reduce the impact from blast vibration. The Environmental Coordinator also confirmed that a temporary blast monitor would be installed at the complainant's property within the week so that more accurate feedback could be provided to the complainant on blast vibration. Blast vibration results were within statutory limits and were 2.95 mm/s at the closest monitor.
20/10/2011 11:16 AM	Denman Road	Blast vibration	A complainant called the community response line to register a complainant about blast vibration that was felt at their residence. The Environmental Coordinator promptly returned the call. The Environmental Coordinator informed the resident that the blast was fired at Mt Arthur Coal and that it was located in an area of the mine that was closer than typical to the complainant's residence. Blast vibration results were below statutory limits. Blast vibration was 0.27 mm/s at the monitor closest to the complainant's residence.
22/10/2011 10:30 PM	Roxburgh Road	Operational noise	The complainant called the community response line to register concern about ongoing low frequency noise. The Environmental Coordinator returned the complainant's call. The complainant explained that a constant low frequency noise was making it difficult to sleep and that the noise had been constant and not just on that night. The complainant noted that they had recently called neighbouring mines but felt that it was coming from the direction of the Mt Arthur Coal operation on that night. The Environmental Coordinator advised the complainant that Mt Arthur Coal was waiting for feedback from consultants following noise monitoring on their property. After the call, the Environmental Coordinator contacted the Open Cut Examiner who investigated potential noise sources from the operation. A noise source consistent with the complainant's description was not found.
31/10/2011 5:00 AM	Denman Road	General dust	A complaint was received by the Office of Environment & Heritage Pollution Line regarding dust from the Mt Arthur Coal mine along Denman Road at about 5am on 31 October 2011. The Office of Environment & Heritage informed the Environment and Community Manager at Mt Arthur Coal the following day. The subsequent investigation confirmed that dust levels were higher than typical for a short period on the morning of 31 October 2011 as wind speeds increased, reaching a maximum of 34 micrograms per cubic metre at 3.30am. These levels had receded by 5am and at no time did dust levels exceed the statutory limit. The investigation also revealed that not all water carts were operating at Mt Arthur Coal on the morning concerned due to manning and maintenance issues. The results of this investigation were communicated to the Office of Environment & Heritage and also to the Mt Arthur Coal production department to reinforce water cart operation as a key component of Mt Arthur Coal's integrated strategy to prevent dust emissions.

Date and time	From	Issue	Investigation and response to complainant
02/11/2011 12:30 PM	Denman Road	Blast vibration	The complainant rang the community response line regarding blast vibration. The Community Superintendent returned the call but was unable to contact the complainant and left subsequent messages. Blast vibration results were below statutory limits. Vibration was recorded at 0.34 mm/s at the nearest monitor.
16/11/2011 11:00 AM	Antiene	Train noise	Correspondence was received by fax from a complainant regarding noise that sounded like tipping and reversing sounds on the night of the 12 November, noise from trains on the night of the 13 November, and noise and vibration from a blast on 14 November 2011. The Community Relations Coordinator contacted the complainant to ascertain further details about noise concerns and to confirm that Mt Arthur Coal did not blast on the 14 November. During the discussion, the complainant confirmed that the noises sounded like dragging or tipping and that the train noises started early evening. The Community Relations Coordinator confirmed that rail movements on the 13 November were significantly lower than the previous seven day average. The complainant further noted that train noise on the night of the 15 November was significant and that they were going to send further correspondence regarding train noise on this night. The Community Relations Coordinator committed to finding out the number of train movements on the night of the 15 November. The Community Relations Coordinator made a follow-up phone call to the complainant on the 18 November to discuss train movements and confirmed that three train movements occurred between the hours of 6pm on the 15 November and 6am on the 16 November.
23/11/2011 12:06 PM	Antiene	Train noise	A complaint was received by fax on 23 November 2011 raising concerns about noise on the night on 21 November 2011 and dust levels in general. The Environmental Coordinator attempted to call the complainant on a number of occasions to ascertain further details until they were able to speak to the complainant on 29 November. The Environmental Coordinator advised the complainant that it was unlikely that Mt Arthur Coal operations were the source of the noise on the night of 21 November because operations were significantly reduced due to wet conditions and trains were not operating at this time. The complainant raised additional concerns about a constant noise on the night of 20 November and train engine noise during the early morning hours of 29 November. The Environmental Coordinator could not identify the source of the noise on 20 November and committed to investigating train movements on 29 November. It was later confirmed that there were two trains loaded between midnight and 6am on that day. Both trains loaded and departed quickly and would have been unlikely to cause a protracted engine idling noise. The Environmental Coordinator confirmed that the complainant's concern about dust was general and not related to a specific period of time. Mitigation measures implemented at the residence in accordance with Project Approval 09_0062 to mitigate the impacts of dust were discussed along with dust control measures implemented at Mt Arthur Coal. The complainant also raised concern about a light shining onto Thomas Mitchell Drive. The Environmental Coordinator committed to investigating the source of the light and arranging for the light to be moved if it was found to be shining onto the road. On investigation the source of the light could not be found.
29/11/2011 10:00 PM	Edderton Road	Lighting	A person driving along Edderton Road called the community response line to register a complaint about lights shining onto Edderton Road from the direction of Mt Arthur Coal operations. The Environmental Superintendent immediately contacted the Open Cut Examiners who inspected the lights in question and reoriented their direction. The complainant was then contacted and advised of the action taken.
30/11/2011 10:00 PM	Edderton Road	Lighting	A complaint was received from the same complainant who called the previous night regarding lights shining onto Edderton Road. The complainant noted that the lights had improved but were still shining onto the road. The Environmental Superintendent contacted the Open Cut Examiner and lights at the Edderton Road maintenance shut down pad were moved in response to the complainant's concern. Maintenance personnel were also advised to inspect lighting direction each evening to ensure that there is no off-site impact.

Appendix 9 – Complaints during 2011 continued

Date and time	From	Issue	Investigation and response to complainant
06/12/2011 4:45 PM	Thomas Mitchell Drive	Other environmental	The Community Relations Coordinator received a complaint via a phone call to the main office regarding the presence of weeds at Mt Arthur Coal. The Complainant stated that they saw St Johns Wort located from the main entrance of the site to the railway line (while travelling along Thomas Mitchell Drive) and wanted to find out if and when anything was going to be done about it. The complainant was concerned that they had also witnessed the weed during the prior year, and were not informed of any plans that Mt Arthur Coal had in place to control these weeds. The complainant was concerned that the St Johns Wort hadn't been treated and that there was only a small window of opportunity to do so. The Community Relations Coordinator committed to ascertain the status of the weed and treatment. On returning the complainant's call, the Community Relations Coordinator confirmed that Mt Arthur Coal had been aware of the weed and that weed spraying had commenced on the Monday, including at the location identified by the complainant.
20/12/2011 12:00 PM	Roxburgh Road	Blast fume	A complainant contacted the community response line to register a complaint regarding blast fume from Mt Arthur Coal. The complainant spoke with the Community Superintendent and advised that the blast fume was orange in colour and moved toward the complainant's property. The complainant advised the Superintendent that they were not requesting monitoring results in this specific case. A pre-blast assessment prior to the blast confirmed that the wind speed and direction was suitable for the blast fired. Observations at the time of the blast confirmed that the wind was from the south east and that blast fume did not leave site.
30/12/2011 9:25 AM	Roxburgh Road	Odour	A Roxburgh Road resident called to register a complaint regarding odour from spontaneous combustion at their property on 29 December at approximately 5am. The complainant asked whether there were new spontaneous outbreaks at Mt Arthur Coal. The Environmental Advisor informed the complainant that spontaneous combustion outbreaks were limited to the old Bayswater areas of the mine site and, because activities in this area were limited, new outbreaks were not common and generally minimal in size. The Environmental Advisor also explained that Mt Arthur Coal continuously attempted to seal some areas of spontaneous combustion outbreaks as part of an on going management plan. The complainant also noted that he had sighted an outbreak of St Johns Wort near the boundary of the Mt Arthur Coal site along Denman Road, near the Bengalla Road intersection. The complainant also noted concerns about weeds at a Roxburgh Road property owned by Mt Arthur Coal. The complainant requested that he be informed about Mt Arthur Coal's weed management program, particularly when spraying was planned. The Environmental Advisor committed to providing this information to the complainant.

Further Information

Julie McNaughton
Environment and Community Manager

Mt Arthur Coal
Thomas Mitchell Drive
PMB 8 Muswellbrook NSW 2333
Phone 02 65445 800
Fax 02 65445 801
www.bhpbilliton.com
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