



# WILPINJONG COAL MINE

## ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

February 2012



**Annual Environmental Management Report**  
1 January 2011 - 31 December 2011



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<b>Name of Mine:</b>	WILPINJONG COAL MINE
<b>Titles/Mining Leases:</b>	ML 1573
<b>MOP Commencement Date:</b>	FEBRUARY 2007
<b>MOP Completion Date:</b>	JANUARY 2012
<b>AEMR Commencement Date:</b>	1 JANUARY 2011
<b>AEMR End Date:</b>	31 DECEMBER 2011
<b>Name of Leaseholder:</b>	WILPINJONG COAL PTY LIMITED
<b>Name of Mine Operator (if different):</b>	THIESS PTY LTD
<b>Reporting Officer:</b>	SHAUN CLEARY
<b>Title:</b>	ENVIRONMENT AND COMMUNITY MANAGER
<b>Signature:</b>	 _____
<b>Date:</b>	25 February 2012

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## **AERIAL PHOTOGRAPH**

Wilpinjong Coal Mine Aerial Photograph – September 2011



**Electronic Copy**

**This Report and Appendices are available on the Peabody web site at**

**[www.peabodyenergy.com.au/nsw/wilpinjong-documents.html](http://www.peabodyenergy.com.au/nsw/wilpinjong-documents.html)**

## 1 INTRODUCTION

Wilpinjong Coal Pty Limited (WCPL) has prepared this Annual Environmental Monitoring Report (AEMR) for the Wilpinjong Coal Mine (the Mine) to satisfy approval, lease and licence reporting conditions as required by Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS), NSW Department of Planning and Infrastructure (DoPI), Office of Environment and Heritage (OEH) and other relevant stakeholders, for the period from 1 January 2011 to 31 December 2011.

This AEMR has been prepared in accordance with Condition 3, Schedule 5 of Project Approval 05-0021 (Project Approval) granted on 1 February 2006, Conditions 28 and 29 of Mining Lease (ML) 1573 granted on 8 February 2006 and the DTIRIS's *Guidelines to the Mining, Rehabilitation and Environmental Management Process*.

In accordance with Condition 12(a), Schedule 5 of the Project Approval (as modified on 8 September 2010 by the NSW Minister for Planning), copies of this AEMR will be made available to:

- NSW Department of Planning and Infrastructure (DoPI);
- Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS);
- Office of Environment and Heritage (OEH);
- Mid-Western Regional Council (MWRC); and
- Mine Community Consultative Committee (CCC).

In addition, a copy will be made available for viewing to members of the public at the Mine administration office, as well as on the Peabody website ([www.peabodyenergy.com.au/nsw/wilpinjong-documents.html](http://www.peabodyenergy.com.au/nsw/wilpinjong-documents.html)) in accordance with Conditions 12(b) and 12(c), Schedule 5 of the Project Approval.

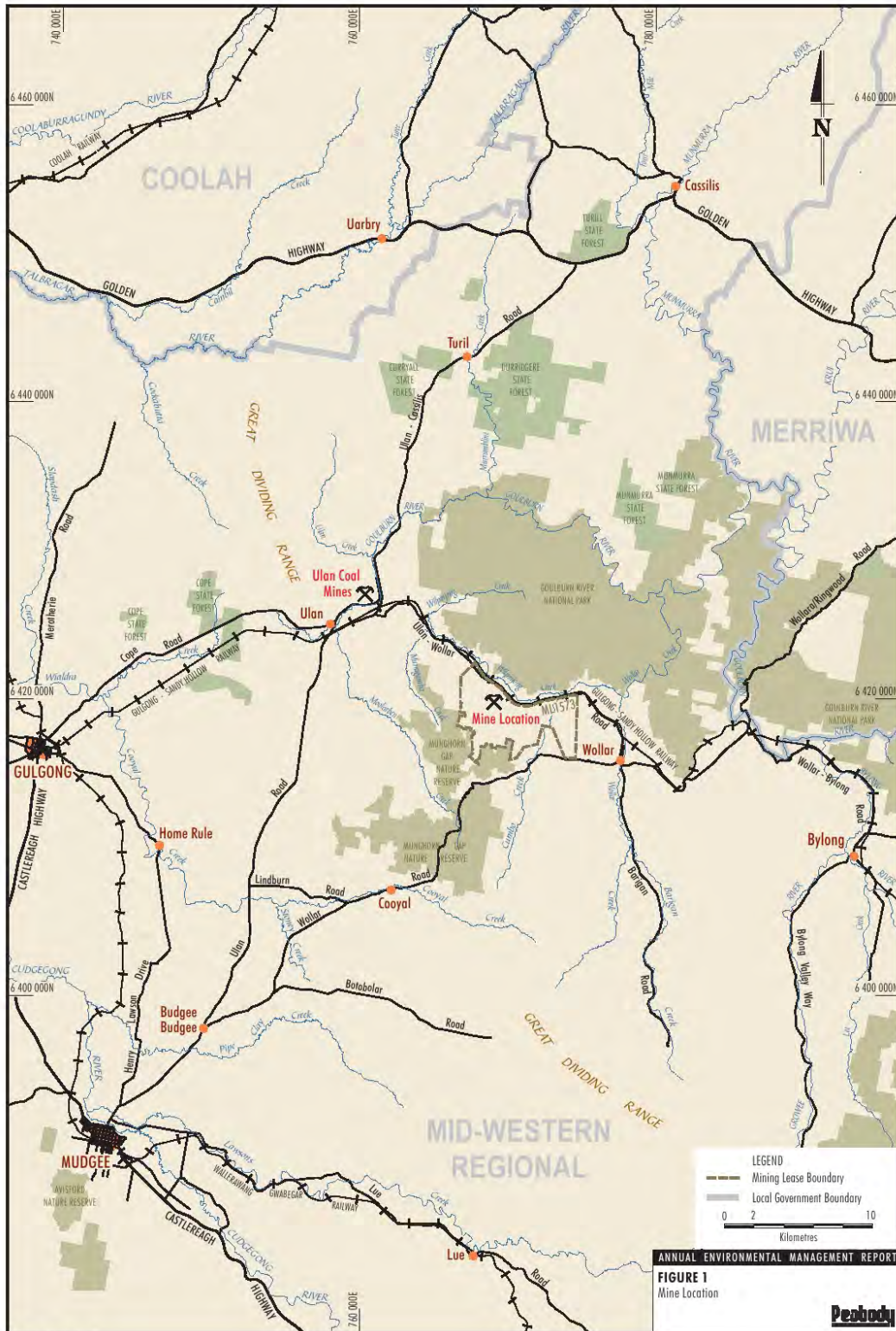
### 1.1 SUMMARY OF OPERATIONS

The Mine is situated approximately 40 kilometres (km) north-east of Mudgee, near the village of Wollar, within the Mid-Western Regional Local Government Area (LGA), in central NSW (Figures 1 and 2).

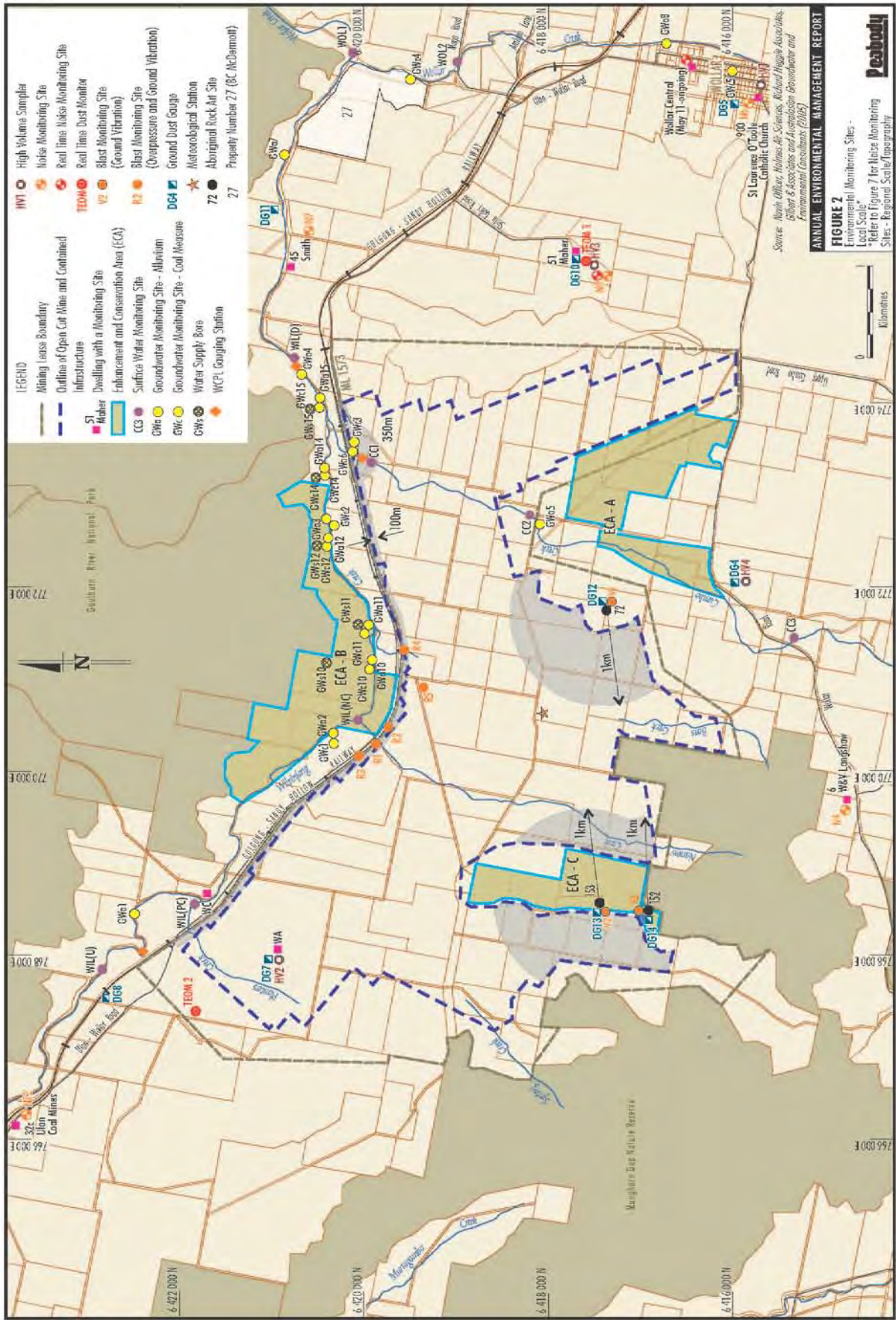
The Mine is surrounded by the narrow flood plains associated with the tributaries of the Goulburn River, the undulating foothills, ridges and escarpments of the Great Dividing Range and the dissected landforms of the Goulburn River National Park. Landuse in the vicinity of the Mine is characterised by a combination of coal mining operations (Ulan and Moolarben Coal Mines), agricultural landuses (primarily grazing) and rural residential development (evident in the local villages of Wollar, Ulan and the localities of Cumbo, Slate Gully and Araluen).

In December 2003, the then Minister for Mineral Resources granted Exploration Licence (EL) 6169 to WCPL under the *Mining Act, 1992*. Project Approval (05-0021) was granted by the Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act, 1979* on 1 February 2006, following submission of the *Wilpinjong Coal Project Environmental Impact Statement* (the EIS) in May 2005.

ML 1573 was granted by the Minister for Primary Industries on 8 February 2006. Construction of the Mine commenced in February 2006, with mining commencing in September 2006.



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The Mine is owned by WCPL, a wholly owned subsidiary of Peabody Pacific Pty Ltd, and is operated by Thiess. The Mine includes an open cut mining operation, Coal Handling and Preparation Plant (CHPP), associated raw and product coal handling facilities, and a train load-out facility.

Approved run-of-mine (ROM) coal production at the Mine is 15 million tonnes per annum (Mtpa). ROM coal is either washed at the CHPP, or by-passed to the product stockpile, prior to being loaded onto trains via the train loading infrastructure. Product coal is then transported by rail to either the Bayswater/Liddell rail unloader or the Port of Newcastle.

## 1.2 APPROVALS, LEASES AND LICENCES

### 1.2.1 Current List of Approvals, Leases and Licences

The Mine operates under the approvals, leases and licences presented in Table 1.

**Table 1  
Mine Approvals, Leases and Licences**

Instrument	Relevant Authority	Date of Grant	Duration of Approval
Project Approval (05-0021)	DoPI	1 February 2006 (Modified on 30 November 2007)	21 years from commencement of Project Approval
ML 1573	DTIRIS	8 February 2006	February 2027
Mining Operations Plan (MOP)	DTIRIS	February 2007 (Modified on 8 September 2010)	January 2012
EL 6169	DTIRIS	June 2008	November 2012
Environment Protection Licence (EPL) (No. 12425)	OEH	8 February 2006	Until the licence is surrendered, suspended or revoked. The licence is subject to review every three years
Production (Cumbo) Bore - Water Licence 20BL 169659	NOW	December 2005	December 2010 (Renewal Application Lodged)
Water supply bores – Water Licence 20BL 170058 and 20BL 170059	NOW	19 December 2006	18 December 2011 (Renewal Application Lodged)
Water supply bores – Water Licence 20BL 170061 to 20BL 170063	NOW	19 December 2006	18 December 2011 (Renewal Application Lodged)
Dewatering Bores - Water Licence 20BL 170147 to 20BL 170153	NOW	31 March 2006	30 March 2011 (Renewal Application Lodged)
Monitoring Bore - Water Licence 20BL 170215	NOW	1 May 2006	Perpetuity
Monitoring Bores - Water Licence 20BL 170217 to 20BL 170229	NOW	1 May 2006	Perpetuity
Water supply bores - Water Licence 20BL 170056; 20BL 170057; 20BL 170068; and 20BL 170088 and 20BL 170089	NOW	15 March 2007	14 March 2012
Water supply bores - Water Licence 20BL 170065	NOW	9 May 2007	12 May 2012
Monitoring Bores - Water Licence 20BL 172784	NOW	4 May 2011	Perpetuity

**Project Approval**

This AEMR has been prepared in accordance with Condition 3, Schedule 5 of the Project Approval. The relevant sections of this AEMR which address Condition 3, Schedule 5 of the Project Approval are outlined in Table 2.

**Table 2  
Summary of Project Approval Condition Reporting Requirements**

<b>Project Approval Condition 6, Schedule 5</b>	<b>AEMR Section</b>
<i>By the end of December 2011, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must:</i>	This AEMR
<i>(a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;</i>	Section 2
<i>(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:</i> <ul style="list-style-type: none"> <li>• <i>Relevant statutory requirements, limits or performance measures/criteria;</i></li> <li>• <i>Monitoring results of previous years; and</i></li> <li>• <i>Relevant predictions in the EA;</i></li> </ul>	Section 3
<i>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</i>	Section 3
<i>(d) identify any trends in the monitoring results over the life of the project;</i>	Section 3
<i>(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and</i>	Section 3
<i>(f) describe what measures will be implemented over the next year to improve the environmental performance of the project.</i>	Section 3

**Mining Lease**

This AEMR has been prepared in accordance with Conditions 28 and 29 of ML 1573 and the Guidelines. The relevant sections of this AEMR which address Conditions 28 and 29 of ML 1573 are outlined in Table 3.

**Table 3  
Summary of Mining Lease Condition Reporting Requirements**

<b>Mining Lease Conditions 28 and 29 of ML 1573</b>	<b>AEMR Section</b>
<i>28. The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the DG.</i>	This document
<i>29. The EMR must:</i> <ul style="list-style-type: none"> <li>• <i>report against compliance with the MOP;</i></li> <li>• <i>report on progress in respect of rehabilitation completion criteria;</i></li> <li>• <i>report on the extent of compliance with regulatory requirements; and</i></li> <li>• <i>have regard to any relevant guidelines adopted by the Director-General.</i></li> </ul>	Sections 1 to 6 Section 5 Section 3 Sections 1 to 6

***Mining Operations Plan***

The current MOP covers the period from September 2010 – January 2012 and was approved in September 2010 following an approved variation to the original MOP.

## **Environment Protection Licence**

Environment Protection Licence (EPL) 12425 was issued by DECC on 8 February 2006. A copy of EPL 12425 is available on the Mine website ([www.peabodyenergy.com.au/nsw/wilpinjong-documents.html](http://www.peabodyenergy.com.au/nsw/wilpinjong-documents.html)).

### **1.2.2 Approval Variations Applicable to the Mine**

#### **Project Approval**

No modification to the Project Approval was made during the reporting period.

#### **Environmental Protection Licence**

There were four EPL variations during the reporting period.

A Variation on the 22/02/2011 was undertaken to review the licence following the approval of a section 75W Modification. Removal of the condition of an emergency discharge licence expired and all conditions pertaining have been removed. No offsite water discharges are permitted by the licence. The emergency discharge licence was valid from the 07/12/2010 until 31/01/2011. Waste disposal of Tyres in pit, total of 60 tonnes per annum.

A Variation on the 08/06/2011 was to amend blasting conditions to provide further guidance and clarity. The dust depositional limits have been removed from all the DDG monitoring locations situated on mine owned land. This leaves limits of 4gm/m<sup>2</sup>/month on DDG5 and DDG10.

A Variation on the 05/07/2011 was for the removal of Special Condition E1 as the monitoring equipment required by condition M7.2 had been installed and is operational.

Three monitoring points were added for discharge to waters.

These are Site 24 (Pit 2 west), Site 25 (Ed's Lake) and Site 26 (Recycled Water Dam).

Pollutant monitoring criteria are shown in Table 4.

Volume limits for each site are: Site 24 – 5 ML/day; Site 25 – 2 ML/day; and Site 26 – 3 ML/day.

**Table 4  
Summary of Pollutant monitoring criteria for discharge to waters.**

<b>Pollutant</b>	<b>100 percentile concentration limits</b>	<b>Sampling Frequency</b>	<b>Sampling method</b>
EC	1500µS/cm	Continuously during discharge	Continuously
Oil & Grease	10mg/L	Daily during discharge	Grab Sample
pH	6.5 – 8.5	Continuously during discharge	Continuously
Total Suspended Solids	50mg/L	Daily during discharge	Grab Sample

After six months from commissioning the water treatment plant:

- EC will be reduced to a limit of 500µS/cm for all sites; and
- A flow regime which is variable and consistent with the ephemeral nature of the flows in Wilpinjong and Cumbo Creeks.

A Variation on the 02/12/2011 was to amend the licence to include a Pollution Reduction Program (PRP). The dust depositional limit has been removed from DDG10 monitoring location. This leaves a limit of 4gm/m<sup>2</sup>/month on DDG5.



### 1.3 MINE CONTACTS

Contact details for the Mine are provided below:

**General Manager**

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**Environment and Community Manager**

Shaun Cleary

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Fax: (02) 6373 4575

Email: [scleary@peabodyenergy.com](mailto:scleary@peabodyenergy.com)

The street and postal address for the Mine is provided below:

**Street Address**

1343 Ulan-Wollar Road

Wollar NSW 2850

**Postal Address**

Locked Bag 2005

Mudgee NSW 2850

## 1.4 ACTIONS REQUIRED AT THE PREVIOUS AEMR MEETING

An AEMR meeting was held on 28 April 2011 at the Mine site for review of the 2010 AEMR.

DTIRIS recommendations are as follows;

- That enforcement action undertaken by the Department in September 2010 is included in the 2011 report, as these were omitted in the 2010 report. These actions included a suspension of work order and the issuing of a penalty infringement notice.
- Plans are difficult to read, ensure plans are clear and convey all required information.
- Include a copy of the review letter.

DoPI recommendations are as follows;

- The AEMR does not provide adequate comparison of monitoring results to baseline data, previous results and/or relevant criteria. This is applicable to waste, air quality, greenhouse gas emissions, surface water quality, creek flow-volumes, stream health, groundwater quality and groundwater levels. Each relevant section needs to contain a summary table or graph of previous results against results from this reporting period and/or the relevant criteria.
- In accordance with Schedule 5, Condition 7 (and Schedule 5, Condition 5 of the previous Project Approval) of the Project Approval, Wilpinjong Coal Pty Ltd (WCPL) is required to report any exceedance of the criteria to the Department and other relevant agencies. WCPL is required to provide a detailed explanation about why this has not been done for dust deposition data (4 months), groundwater quality (EC levels at 4 sites), blast monitoring results (1 exceedance) and noise exceedances (e.g. Sleep disturbance @ Harkin residence).
- Plan 1 and 3 are poor quality and the legends are illegible. Plan 2 is not included in the document.
- It would be useful to provide wind roses of each month or season in order to assist in explaining some of the air quality/noise results.
- Section 3.4.2 – the mean monthly dust data at DG12 appears to be directly related to mining operations. The Department requires a more detailed investigation to demonstrate what is being done to ensure that there is no impact on the rock art site in the vicinity of this DDG.
- Section 3.6.1 – Figures 6a, 6b and 6c indicate that there were several gaps in the EC data at the Upstream Wilpinjong station and the Cumbo Creek station (approximately 7 months of missing data). It is recommended that these stations are more regularly serviced and maintained to ensure continuous monitoring results throughout the reporting period. The AEMR should contain information on how these monitoring equipment failures will be avoided in future.
- Figures 6d to 6f – the stream flow data presented in these figures does not seem to correlate to the rainfall data presented in Figure 3. Some of the highest rainfalls on record were recorded during November and December 2011, but these are not shown in actual stream flows. The Department requests a more detailed investigation and explanation of the reductions in flow volumes being recorded.
- The Bio-Analysis stream health monitoring report should be included as an appendix to the AEMR and a tabulated summary of the results (compared to baseline results) should be included in Section 3.6.2.
- Section 3.9.2 – the AEMR should include a copy of the results of attended noise monitoring undertaken during the reporting period. The AEMR does not include a summary of the unattended noise monitoring results (as indicated on page 45).
- Section 3.10.1 should include detailed information on the results of the archaeological salvage program, including: location, nature and significance of the artefacts collected; written reports from the field archaeological representative; and correspondence from the Local Aboriginal community attending the excavation.
- Section 3.13.1 – Copies of pre-clearance surveys and habitat tree mapping should be included in an appendix to the AEMR. Reports for the monitoring of rehabilitation areas should be included in an appendix to the AEMR and a summary of the results, compared to previous year's results, should be included in the body of the report.

## 2 OPERATIONS DURING THE REPORTING PERIOD

The following sections detail the operations and activities undertaken at the Mine during the reporting period.

### 2.1 EXPLORATION

A summary of the exploration, drilling and other geology-related activities undertaken during the reporting period is provided below:

A total of 51 exploration drill holes were drilled during the reporting period within the ML1573 (Table 5). Nine of these were converted into piezometer monitoring holes.

A total of five piezometer monitoring holes were drilled during the reporting period within the ML1573 in the vicinity of Cumbo Creek.

**Table 5  
Summary of Exploration Drilling**

Hole Id	Hole Type	Tenement	Comments	TD (m)^
AP001	Piezometer	ML1573	Slotted casing from 1.20 to 3.70m	4.00
AP002	Piezometer	ML1573	Slotted casing from 2.00 to 3.50m	4.00
AP003	Piezometer	ML1573	Slotted casing from 1.10 to 4.10m	6.00
PW1080A	Piezometer	ML1573	Slotted casing from 4.00 to 17.90m	18.00
PW1090	Structure, Stratigraphy and Coal quality	ML1573	Hole number altered post drilling	44.95
PW1091	Structure, Stratigraphy and Coal quality	ML1573	Hole number altered post drilling	74.00
PW1092	Piezometer & Coal quality	ML1573	Slotted casing from 3m below collar to T.D.	36.00
PW1093	Piezometer & Coal quality	ML1573	Slotted casing from 3m below collar to T.D.	30.64
PW1094	Piezometer & Coal quality	ML1573	Slotted casing from 3m below collar to T.D.	26.88
PW1095	Piezometer & Coal quality	ML1573	Alluvials encountered at 35m. Hole collapsed and abandoned.	35.00
PW1095A	Piezometer & Coal quality	ML1573	Slotted casing from 3m below collar to T.D.	47.89
PW1096	Piezometer & Coal quality	ML1573	Hole cleaned out and deepened on 09/11/2011	47.83
PW1097	Piezometer & Coal quality	ML1573		50.93
PW1098	Piezometer & Coal quality	ML1573		26.68
PW1099	Piezometer & Coal quality	ML1573		34.84
PW1100	Piezometer	ML1573		41.60
PW5155	Oxidation Drilling	ML1573		28.00
PW5156	Oxidation Drilling	ML1573		28.00
PW5157	Oxidation Drilling	ML1573		28.00

PW5158	Oxidation Drilling	ML1573		27.00
PW5159	Oxidation Drilling	ML1573		34.00
PW5160	Oxidation Drilling	ML1573		31.00
PW5161	Oxidation Drilling	ML1573		31.00
PW5162	Oxidation Drilling	ML1573		28.00
PW5163	Oxidation Drilling	ML1573		27.00
PW5164	Oxidation Drilling	ML1573		31.00
PW5165	Oxidation Drilling	ML1573		35.00
PW5166	Oxidation Drilling	ML1573		25.00
PW5167	Oxidation Drilling	ML1573		21.00
PW5168	Oxidation Drilling	ML1573		23.00
PW5169	Oxidation Drilling	ML1573		20.00
PW5170	Oxidation Drilling	ML1573		13.00
PW5171	Oxidation Drilling	ML1573		13.00
PW5172	Oxidation Drilling	ML1573		22.00
PW5173	Oxidation Drilling	ML1573		19.00
PW5174	Oxidation Drilling	ML1573		15.00
PW5175	Oxidation Drilling	ML1573		19.00
PW5176	Oxidation Drilling	ML1573		17.00
PW5177	Oxidation Drilling	ML1573		18.00
PW5178	Oxidation Drilling	ML1573		16.00
PW5179	Oxidation Drilling	ML1573		27.00
PW5179A	Oxidation Drilling	ML1573	Hole number altered post drilling. Originally named PW5179B.	27.00
PW5180	Oxidation Drilling	ML1573		24.00
PW5181	Oxidation Drilling	ML1573		26.00
PW5182	Oxidation Drilling	ML1573		27.00
PW5183	Oxidation Drilling	ML1573		45.50
PW5184	Oxidation Drilling	ML1573		39.00
PW5185	Oxidation Drilling	ML1573		42.50
PW5186	Oxidation Drilling	ML1573		27.50
PW5187	Oxidation Drilling	ML1573		30.50
PW5188	Oxidation Drilling	ML1573		27.50
PW5189	Oxidation Drilling	ML1573		33.00
PW5190	Oxidation Drilling	ML1573		30.00
PW5191	Oxidation Drilling	ML1573		35.50
PW5192	Oxidation Drilling	ML1573	Hole collapsed. Stepped off half metre and drilled as PW5192B.	6.00
PW5192A	Oxidation Drilling	ML1573	Hole number altered post drilling. Originally named PW5192B.	30.00

^ Total Depth in metres

- No extra water supply bores were drilled and equipped.

## 2.2 LAND PREPARATION

Land preparation activities undertaken during the reporting period relating to vegetation clearance, threatened species management and Aboriginal cultural heritage management were implemented in accordance with the MOP, Rehabilitation Management Plan (RMP) and Aboriginal Cultural Heritage Management Plan (ACHMP).

During the reporting period, approximately 138,877 bank cubic metres (bcm) of topsoil was stockpiled, which is a decrease of 72,685 bcm on the previous reporting when 211,562 bcm of topsoil was stockpiled.

Proposed land preparation activities to be undertaken during the next reporting period are shown on Plan 1.

### 2.3 CONSTRUCTION

There were a number of construction activities undertaken during the reporting period. They were:

- Six evaporators were uninstalled adjacent to Pit 2;
- An extension to the Thiess offices was constructed adjacent to existing offices in December;
- New ROM stockpile area; and
- Taggart commenced the CHPP expansion project in December 2010; the following were all constructed during the reporting period. Schematic diagram and photographs of the expansion is in Appendix K.
  - ROM bin 2;
  - Raw Coal Conveyor CV-104;
  - Raw Coal Sizing Station;
  - Raw Coal Conveyor CV-105;
  - Plant Feed Conveyor CV-202;
  - Plant Feed Conveyor CV-202 Transfer Station;
  - Wash Plant Expansion;
  - Thickener Expansion;
  - Liming Plant;
  - 66kV Expansion;
  - Product CV-601 CV-605 Tripper;
  - Product Transfer Conveyor CV-605;
  - Product Transfer CV-605 CV-606 Transfer Station;
  - Product Transfer Conveyor CV-606;
  - Product Reclaim Valve under CV-606
  - Product Reclaim Conveyor CV-802; and
  - Product Reclaim CV-802 CV-801 Transfer Station.

### 2.4 MINING

12,579,891 tonnes (t) of ROM coal was mined during the reporting period (Table 6).

**Table 6  
Production Schedule**

Year	Month (from/to)	Mine Waste Rock (Overburden) Removed (bcm)	ROM Coal Mined (t)	ROM Coal Crushed (t)	ROM Coal Processed (CHPP Feed) (t)	Product Coal (t)
2011	Jan - Dec	18,786,228	12,579,891	11,216,769	6,059,262	8,984,468

Source: Thiess (2012)

t = tonne

At the end of the reporting period open cut mining operations were located in Pit 1, Pit 2 and Pit 5. The proposed mining sequence is shown on Plan 2.

WCPL received a Penalty Infringement Notice (PIN) on the 28<sup>th</sup> September 2010, relating to mining out of sequence as purported in the MOP.

The MOP was revised to include the amended area, which was approved by DTIRIS NSW.

## **2.5 PROCESSING**

The Mine produces both unwashed and washed product coal. The coal handling and processing infrastructure has been established to accommodate the processing of raw coal, the handling of raw and washed product coal, and the stockpiling and train loading of product coal.

Stockpiles located near the infrastructure area are used to store various qualities of raw coal excavated from the mining pits. Various stockpiles are managed around the ROM area to ensure product coal quality can be appropriately managed. The raw coal mined is either stockpiled or direct fed into the ROM bin.

The CHPP accommodates the processing of ROM coal, handling of ROM coal, reject and product coal and stockpiling and train loading of product coal. A primary crusher crushes the coal for the secondary crushers to further crush and size the coal. The resultant product is either raw product coal or raw feed for the processing plant. Approximately 11.3 Mt of raw coal was crushed during the reporting period (Table 5). Approximately 8.99 Mt of ROM coal was processed during the reporting period.

A large radial stacker manages the stockpiling of sized coal across three valves. These product stockpiles have a combined capacity of approximately 490,000 t. The stockpiles are separated into various raw and washed product stockpiles, with different coal qualities, to ensure railed product coal quality is appropriately managed. A series of four feeder valves located beneath the product stockpiles are used to supply the train load out conveyor. The raw feed stockpile supplies the processing plant with product for washing via a feeder valve and conveyor on which the stockpile sits.

The CHPP is capable of producing multiple washed coal products for both export and domestic sales which are stockpiled on two stockpiles, one adjacent to the wash plant and the other remotely located behind the original stockpiles.

Process water is obtained from the raw water dam located within the rail loop and any necessary makeup water is obtained by recycled water from the tailings dam and/or the active voids.

A train loading facility capable of loading coal at a rate of 4,000 tonnes per hour (tph) is located at the head of the rail loop within the Mine infrastructure area and receives product coal via a product feed conveyor running the length of the product coal stockpile area. Train loading is available to load trains on a continuous basis, 24 hours a day and 7 days a week, with a maximum of 6 trains per 24 hour period.

The CHPP has approval to operate up to 24 hours per day, seven days per week with a design capacity of approximately 2,800tph through two ROM bins. Raw Coal 1 is approximately 1,600 tph of ROM feed. Raw Coal 2 is approximately 1,200 tph of ROM feed.

## **2.6 WASTE MANAGEMENT**

### **2.6.1 Mining Waste**

18,786,228 bcm of mine waste rock (overburden) was removed during the reporting period.

1,785,841 t of CHPP rejects (i.e. coarse rejects/tailings) were produced during the reporting period, as shown in Table 7.

**Table 7  
Cumulative Production Schedule**

	Cumulative Production		
	Start of Reporting Period	End of Reporting Period	End of Next Reporting Period (estimated)
Topsoil Stripped (bcm)	1,015,764	1,124,068	1,278,068
Topsoil Used/Spread (bcm)	149,800	352,300	492,400
Waste overburden (bcm)	44,085,110	62,871,338	87,888,817
CHPP rejects (t)	5,284,792	7,070,633	9,691,498

Source: Thiess (2012)

## 2.6.2 Non-Mining Waste

### 2.6.2.1 Sewerage Treatment and Disposal

The Mine facilities include three aerated sewage and pumping systems that discharge via an irrigation sprinkler system to within the rail loop, remote crib hut garden and/or CHPP area. These facilities are serviced by a licensed contractor on a 6 monthly basis or as required.

### 2.6.2.2 Oil and Grease Disposal

An oil/water separator is located downstream of the workshop area and a manually operated oil/water separator is located at the vehicle washdown bay area.

Oil water separators are maintained in house by Thiess personnel. Any sediment trapped in the oil water separator sump is removed and placed in the site landfarm for rehabilitation. All waste hydrocarbons collected via the separators are disposed of via a licensed waste disposal company (i.e. Thiess Services) on a monthly basis.

The oil-water separator has been enlarged to cope with the increased activities from the work shop site expansion in 2010. This involved an additional sump attachment and plate replacement.

### 2.6.2.3 Waste Disposal

During the reporting period, site employees received training on appropriate waste management practices and the importance of minimising resource consumption. Wastes were segregated according to type to recycle materials such as paper, cardboard, plastics, metals and oil filters. Air filters were also reused. Lids on waste and recyclables skips were also kept closed to prevent scattering of materials by wind and vermin.

On-site waste is managed in accordance with the principles of waste minimisation. A summary of waste figures for the reporting period are provided in Table 8.

EPL Condition L4.1 allows no greater than 60 tonnes of waste tyres to be buried at pit floor. 60 tonnes of tyres were buried at pit floor in Pit 5 South during the reporting period.

**Table 8  
Monthly Waste Summary**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>General waste (kg)</b>	10,540	21,570	8,630	8,820	14,485	18,890	7,730	28,910	8,230	20,390	11,570	5,980	165,745
<b>Oily rags (kg)</b>	160	0	75	0	160	290	181	283	160	60	100	97	1,566
<b>Recycling – Paper and Cardboard (kg)</b>	600	0	1,225	580	380	460	240	773	623	740	823	1,180	7,624
<b>Waste oil filters (kg)</b>	2,985	1,446	1,425	991	1,866	3,040	1,838	978	2,632	1,125	1,160	1,276	20,762
<b>Scrap steel (kg)</b>	20,400	10,940	2,180	8,560	10,160	16,680	12,880	15,320	12,430	8,320	0	9,160	127,030
<b>Recycled oil (L)</b>	61,500	17,000	33,500	19,000	25,800	41,000	20,000	40,000	40,000	23,400	26,000	23,500	370,700

Source: Thiess (2012)  
kg = kilograms  
L = litre

## 2.7 ROM PRODUCT COAL STOCKPILES

The ROM coal stockpiles located in the infrastructure area were used to stockpile raw coal excavated from the mining pits (Plan 2). These stockpiles had a total capacity of between 230 000 t to 650 000 t during the reporting period. Each stockpile is managed dependant on quality and age. A new ROM stockpile area was constructed; this area has a total capacity of approximately 450,000 t. This brings the total ROM stockpiles having an approximately 1,100,000 t capacity.

A radial stacker and the clean coal conveyor are used to manage the stockpiling of coal across the product stockpiles (combined capacity of approximately 490,000t). The radial stacker was commissioned in the first quarter of 2007. The clean coal conveyor is in the final stages of commissioning at the end of the reporting period.

During the reporting period, approximately 8.99 Mt of coal (comprised of ROM and product coal) was transported from the Mine site via rail at an average of 3.18 train movements per day to the end of the reporting period.



## 2.8 WATER MANAGEMENT

Water management activities were undertaken during the reporting period in accordance with the Mine water management system outlined in the MOP and Site Water Management Plan (SWMP).

A summary of surface water and groundwater management activities undertaken during the reporting period is provided in Sections 3.6 and 3.7.

Table 9 provides the volume of water held in the water storages at the start and end of the reporting period.

**Table 9  
Volume of Water Stored On-site**

	Start of Reporting Period (ML)	Total at End of Reporting Period (ML)	Storage Capacity (ML)
Clean water dam (ML)	47	39	50
Pit 2*	1928	2853	3470
Ed's Lake	53	43	80
Recycled water dam (ML) (located south of administration)	323	283	450

Source: Thiess (2011)

\* Pit 2 was used as temporary water storage.

ML = megalitre

WCPL were successful in applying for an emergency water discharge licence on 07/12/2010. This licence operated from 09/12/2010 and expired 31/01/2011. A summary of the discharge activities undertaken during the reporting period is provided in Table 10. A total of 353,151KL was discharged from site under the emergency discharge licence in 2010-11, with a total of 141,409KL discharged during the reporting period.

**Table 10  
Volume of Water Discharged Off-site<sup>1</sup>**

	EPA identification number 21	EPA identification number 22	EPA identification number 23	EPA identification number 24	Daily discharge from site (KL)	Cumulative discharge total from site (KL)
	Ed's Lake	Pit 2 West	Recycled Water Dam	Pit 2 South		
DATE	Daily discharge (KL)	Daily discharge (KL)	Daily discharge (KL)	Daily discharge (KL)		
1/01/2011	5,060	2,520	2,880	No discharge	10,460	10,460
2/01/2011	5,060	2,260	4,100	No discharge	11,420	21,880
3/01/2011	5,300	2,210	4,300	No discharge	11,810	33,690
4/01/2011	5,380	No discharge	4,600	No discharge	9,980	43,670
5/01/2011	5,999	No discharge	4,500	No discharge	10,499	54,169
6/01/2011	5,890	No discharge	1,800	No discharge	7,690	61,859
7/01/2011	4,790	No discharge	3,800	No discharge	8,590	70,449
8/01/2011	4,800	No discharge	3,400	No discharge	8,200	78,649
9/01/2011	5,100	No discharge	3,600	No discharge	8,700	87,349
10/01/2011	5,100	No discharge	No discharge	No discharge	5,100	92,449
11/01/2011	2,000	No discharge	No discharge	No discharge	2,000	94,449
12/01/2011	1,800	No discharge	No discharge	No discharge	1,800	96,249
13/01/2011	4,100	No discharge	2,700	No discharge	6,800	103,049
14/01/2011	No discharge	No discharge	No discharge	No discharge	0	103,049
15/01/2011	No discharge	4,900	No discharge	No discharge	4,900	107,949
16/01/2011	No discharge	5,500	No discharge	No discharge	5,500	113,449
17/01/2011	No discharge	No discharge	No discharge	No discharge	0	113,449
18/01/2011	No discharge	No discharge	No discharge	No discharge	0	113,449
19/01/2011	No discharge	5,120	No discharge	No discharge	5,120	118,569
20/01/2011	No discharge	3,000	No discharge	No discharge	3,000	121,569
21/01/2011	No discharge	1,200	700	No discharge	1,900	123,469

22/01/2011	No discharge	2,580	600	No discharge	3,180	126,649
23/01/2011	No discharge	2,580	1,290	No discharge	3,870	130,519
24/01/2011	No discharge	1,170	1,290	No discharge	2,460	132,979
25/01/2011	No discharge	800	800	No discharge	1,600	134,579
26/01/2011	No discharge	900	800	No discharge	1,700	136,279
27/01/2011	No discharge	1,800	750	No discharge	2,550	138,829
28/01/2011	No discharge	No discharge	580	No discharge	580	139,409
29/01/2011	No discharge	No discharge	1,000	No discharge	1,000	140,409
30/01/2011	No discharge	No discharge	1,000	No discharge	1,000	141,409
31/01/2011	No discharge	No discharge	No discharge	No discharge	0	141,409

Source: Thiess (2011)

1 For a full set of discharge water quality monitoring results for the reporting period refer to Table B-3, Appendix B  
 KL = kilolitre

## 2.9 HAZARDOUS MATERIALS MANAGEMENT

The major hazardous materials used and stored on-site during the reporting period were explosives, diesel, and other hydrocarbons such as oil.

Two 28,000 L self-bunded double-skinned hydrocarbon (oil) storage tanks, one multi-compartment 110,000 L self-bunded double-skinned hydrocarbon (oil and coolant) storage tank, one 110,000 L bunded and two bunded 88,000 L diesel tanks have been installed and operated in accordance with Australian Standard (AS) 1940:1993 *The Storage and Handling of Flammable and Combustible Liquids* and the *Occupational Health and Safety Act, 2000*. Two shipping containers are used for the storage of grease pods and flammable paints are stored on a containment pallet and in a locked cabinet inside the workshop.

In accordance with the MOP, all chemicals brought on-site are recorded in a register which identifies the compatibility of materials and the emergency response procedures in the event of a spill.

### 2.9.1 Status of Licences

WCPL currently holds a Notification for the Keeping of Dangerous Goods (Notification No. 35/037774) under the *Dangerous Goods Act, 1975* for the magazine areas. This notification is valid until the 8 November 2012. WCPL also holds a licence granted under the *Explosives Act, 2003*, for the possession and storage of explosives, which is valid until 7 November 2012.

WCPL currently holds four Radiation Registrations under the *Radiation Control Act, 1990* for diagnostic imaging apparatus and fixed radiation gauges. Registration RR33340 is valid until 28 November 2014 for selling and/or the possession of radioactive substances or items containing radioactive substances. Registration RR21364 is valid until 25 March 2012 for a fixed Radiation Gauge at the train loading conveyor CV801. Registration RR22565 is valid until 21 July 2013 for the sealed source device at the CHPP thickener underflow line. Registration RR22566 is valid until 21 July 2013 for the sealed source device at the CHPP dense medium circuit.

### 2.9.2 Inventory of Materials Management

An inventory of all goods and materials, including hazardous materials, contained on-site is maintained by Mine personnel. Material Safety Data Sheets (MSDS) for all materials are maintained by Thiess. These sheets provide all critical information for the safe use and handling of substances brought on-site. The Mine also utilises ChemWatch, an online computer-based chemicals management and data system.

### **3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE**

Environmental management measures undertaken during the reporting period have been conducted in accordance with the MOP and management plans and monitoring programmes developed for the Mine (Section 3.1). Monitoring was undertaken throughout the reporting period at the locations shown on Figure 2.

#### **3.1 MANAGEMENT PLANS AND MONITORING PROGRAMMES**

In accordance with the Project Approval and the MOP, the Mine currently operates under a number of management plans and monitoring programmes, including:

- Environmental Management Strategy (EMS).
- Environmental Monitoring Programme (EMP).
- Aboriginal Cultural Heritage Management Plan (ACHMP).
- Noise Monitoring Programme (NMP).
- Blast Management Plan and Monitoring Programme (BMP).
- Spontaneous Combustion Management Plan (SCMP).
- Air Quality Monitoring Programme (AQMP).
- SWMP, including:
  - Site Water Balance (SWB);
  - Erosion and Sediment Control Plan (ESCP);
  - Surface Water Management and Monitoring Programme (SWMMP);
  - Groundwater Monitoring Programme (GMP); and
  - Surface and Groundwater Response Plan (SGWRP).
- Rehabilitation and Landscape Management Plan, including:
  - Rehabilitation Management Plan.

Copies of the above plans are available on the Mine website (<http://www.peabodyenergy.com.au/nsw/wilpinjong-documents.html>).

The above management plans and monitoring programmes have been reviewed by WCPL following the independent environmental audit and are currently being assessed by DoPI.

### **3.2 ENVIRONMENTAL RISK IDENTIFICATION**

In accordance with the Guidelines, the Environmental Risk Identification undertaken as part of the MOP development has been included in this AEMR. The Environmental Risk Identification Matrix contained within the MOP is reproduced in Table 11.

### **3.3 METEOROLOGICAL MONITORING**

In accordance with Condition 24, Schedule 3 of the Project Approval, an on-site meteorological station was operated during the reporting period. The location of the meteorological station is shown on Figure 2. The meteorological station is maintained by Wilpinjong Coal staff, and calibration checks are routinely conducted by NATA accredited technicians. This ensures that continued accurate measurement and calibration are maintained. The meteorological station monitors the following parameters:

- Rainfall;
- Relative humidity;
- Temperature – measured at 2, 10 and 60 metres (m) above the ground surface;
- Wind speed – horizontal and vertical;
- Wind direction – measured at 10 m above the ground surface;
- Sigma theta;
- Pasquill stability classification;
- Solar radiation; and
- Temperature lapse rate.

The meteorological station was upgraded in July 2011. The upgrade includes the installation of a 60m inversion tower. This was to satisfy Condition M4.2 of the EPL.

Three pluviometers also recorded catchment rainfall for Murragamba Creek and Cumbo Creek during the reporting period.

**Table 11  
WCPL Risk Matrix**

	Exploration	Land Preparation, Vegetation and Topsoil Stripping	All Construction Activities including Earthmoving	Mine Development and Mining, Surface and Underground	Use/Maintenance of Roads, Tracks and Equipment	Waste Rock Emplacement and Management	Mineral Processing Facilities and Infrastructure	Ore/Product Stockpiling and Handling	Tailings Impoundment Management	Water Management including Storm Event Contingencies	Hazardous Materials and Fuel, Handling/Spills Management	Sewerage	Rubbish Disposal	Rehabilitation Activities	Rehabilitated Land and Remaining Features
Air pollution, dust/other		X	X	X	X	X		X	X					X	
Erosion/sediment minimisation	X	X	X		X	X				X				X	X
Surface water pollution	X		X				X		X	X	X	X			
Groundwater pollution	X			X					X		X	X			
Contaminated or polluted land							X		X		X	X			
Threatened flora protection	X	X	X		X										X
Threatened fauna protection		X												X	X
Weed control and management	X	X									X			X	X
Operational noise	X	X	X	X		X	X	X						X	
Vibration and air blast		X	X												
Visual amenity, stray light			X			X	X	X						X	
Aboriginal heritage	X	X	X		X					X				x	
Natural heritage conservation (flora)		X													
Spontaneous combustion				X		X		x							
Bushfire	X	X	X		X									X	X
Mine subsidence															
Hydrocarbon contamination	X	X	X	X											
Methane drainage/venting															
Public safety	X	X	X	X	X				X		x				

Source: WCPL (2007)

### 3.3.1 Rainfall

A summary of rainfall data recorded during the reporting period at the on-site meteorological station is provided in Table 12.

**Table 12**  
**Summary of Rainfall Data**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	11.4	33.6	43.4	32.0	38.0	16.6	6.2	41.8	103.8	38.0	145.0	58.0
Cumulative Rainfall (mm)	11.4	45.0	88.4	120.4	158.4	175.0	181.2	223.0	326.8	364.8	509.8	567.8

Source: Peabody Energy (2012)  
mm = millimetres

The month with the highest total rainfall recorded during the reporting period was November with 145.0 mm (Table 12). The total rainfall (567.8 mm) (Table 12) recorded during the reporting period was 489.8 mm less than the previous reporting period, and was lower than the average inferred long-term annual average rainfall of approximately 650 mm at the Mine (Figure 3a).

### 3.3.2 Temperature

A summary of air temperature data recorded during the reporting period at the on-site meteorological station is provided in Table 12.

**Table 13**  
**Summary of Air Temperature Data**

Month (2011)	Air Temperature (°C at 2 m)			Air Temperature (°C at 10 m)			Air Temperature (°C at 60 m)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
January	13.6	40.6	24.15	13.5	39.6	23.83	*	*	*
February	11.2	38.7	23.72	11.7	37.4	23.49	*	*	*
March	9.3	36.1	20.55	9.7	35.2	20.36	*	*	*
April	3.3	29.0	15.75	3.6	28.5	15.71	*	*	*
May	-2.9	23.8	10.63	-2.19	23.9	10.68	*	*	*
June	-1.7	19.8	9.40	-1.48	19.11	9.45	*	*	*
July	-3.5	19.9	8.31	-3.25	19.3	8.33	*	*	*
August	-1.0	24.8	10.59	-0.5	23.9	10.61	2.3 <sup>1</sup>	21 <sup>1</sup>	8.62 <sup>1</sup>
September	0.0	28.9	13.48	-0.3	28.3	13.44	1.7	27.3	13.88
October	2.4	29.1	15.46	2.3	28.8	15.31	3.3	27.5	15.53
November	9.3	34.7	20.46	9.5	34.5	20.38	10.5	33.6	20.15
December	8.9	29.7	18.72	8.8	29.0	18.49	6.9	28.1	17.93

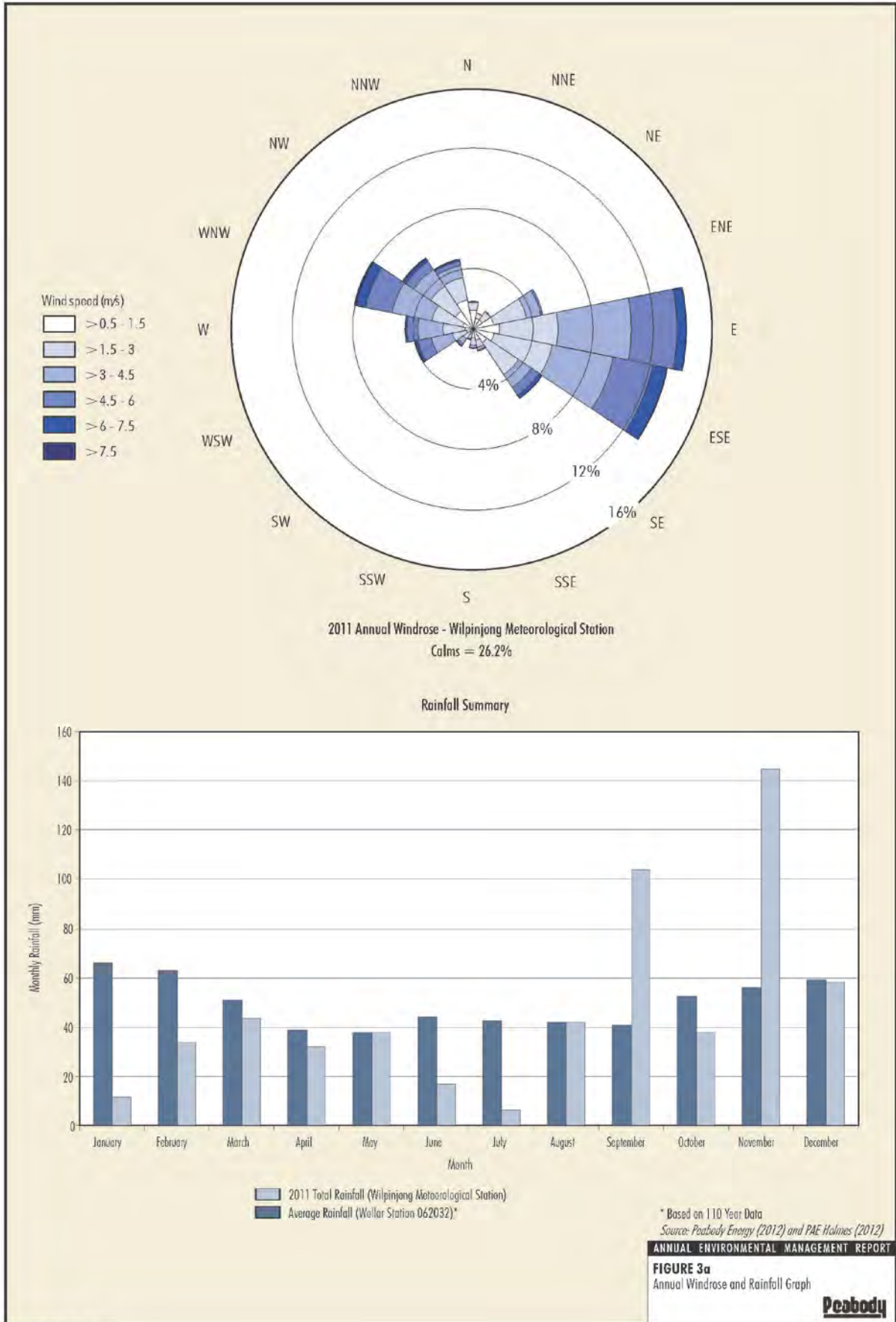
Source: Peabody Energy (2012)  
°C = degrees Celsius

<sup>1</sup> = Inversion Tower not operational until 19/08/2011

\* = No data available

The highest recorded temperature was 40.6°C (at 2 m) and was recorded in January (Table 13). This was 2.08°C higher than the 2010 top temperature of 38.52°C. The lowest recorded temperature onsite was -3.5°C recorded at 2m in August, this is 0.11°C warmer than the 2010 lowest temperature of -3.61°C.

An inversion tower was commissioned in August 2011. The air temperature at 60m has been recorded since 19<sup>th</sup> August 2011. This is used to generate a temperature lapse rate.

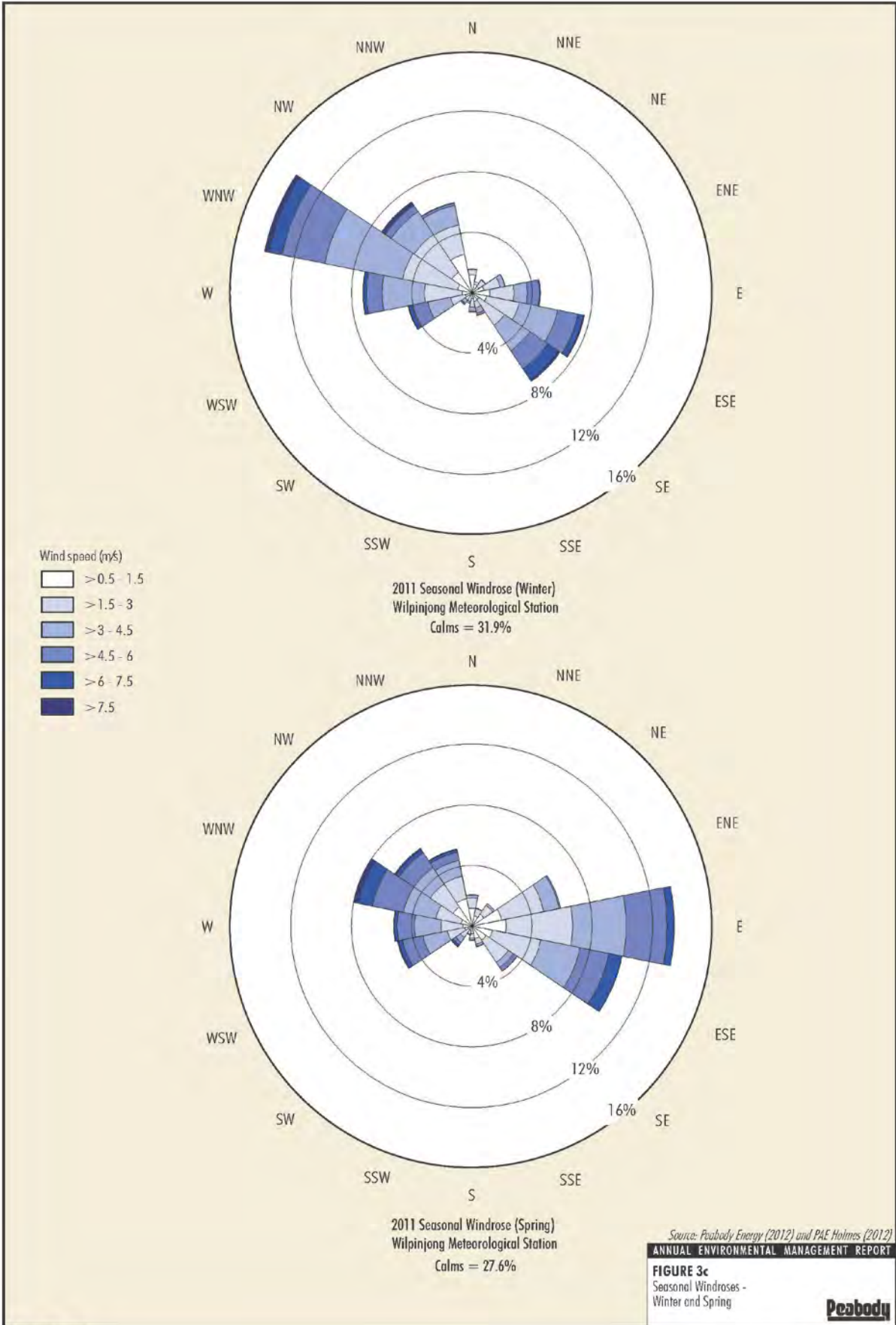


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WIL 05 05 AEMR 11\_0064

### 3.3.3 Wind Speed and Direction

The annual wind rose data from the meteorological station is shown on Figure 3a. Over the reporting period, the wind was predominantly from an easterly direction with the exception of winter which was predominantly from the West-North-West (Figure 3a, 3b and 3c). The seasonal wind rose data from the meteorological station is shown on Figure 3b and 3c.

## 3.4 AIR QUALITY - DUST

### 3.4.1 Environmental Management

Air quality management and mitigation measures were undertaken in accordance with the AQMP (approved by the Director-General of the DoPI in February 2006). As outlined in the AQMP, the Standard Protocol was implemented to facilitate the day-to-day management of dust emissions from Mine activities.

During the reporting period, dust monitoring was carried out in accordance with the AQMP utilising static (dust deposition) and high-volume sampling equipment. The relevant air quality parameters recorded during the reporting period are as follows:

- Deposited dust;
- Particulate matter less than 10 microns in size ( $\mu\text{m}$ ) ( $\text{PM}_{10}$ ); and
- Total suspended particulates (TSP).

In accordance with the AQMP, seven dust deposition gauges were operated during the reporting period to measure deposited dust levels. In addition,  $\text{PM}_{10}$  was monitored via three high volume samplers and two TEOM. Total Suspended Particulate was measured using one high volume sampler.

Air quality monitoring locations are shown on Figure 4a. Table 14 outlines the air quality monitoring parameters, locations and frequencies as described in the AQMP.

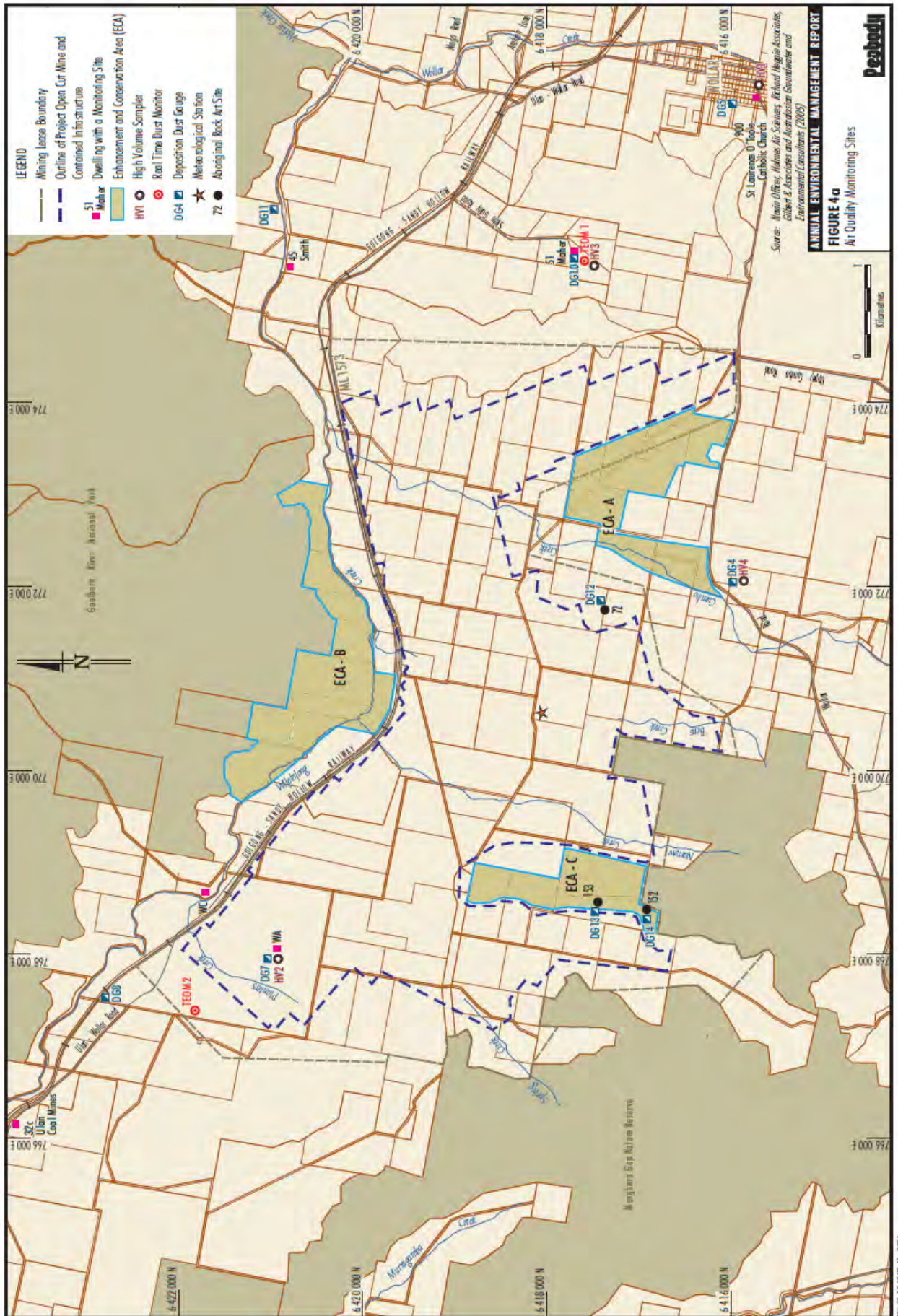
**Table 14  
Summary of the Air Quality Monitoring Programme**

Monitoring Parameter	Monitoring Locations <sup>1</sup>	Frequency
Dust deposition	• DG4, DG5, DG7, DG8, DG10 <sup>2</sup> and DG11	• Monthly
	• DG12, DG13 and DG14 (Aboriginal rock art sites)	• Monthly (when mining within 1 km of the rock art site)
High volume sampling ( $\text{PM}_{10}$ )	• HV1, HV2 and HV4	• Continuous six day cycle
Total Suspended Particulate	• HV3	• Continuous six day cycle
Real time ( $\text{PM}_{10}$ )	• TEOM1 and TEOM2	• Continuous

<sup>1</sup> Monitoring locations are shown on Figure 4a.

<sup>2</sup> Monitoring location formerly referred to as the “Maher” dwelling, now owned by WCPL.

The AQMP lists the Helm (44) dwelling as the proposed air quality monitoring location for DG7. Due to access restrictions and limited power supply, DG7 was re-located to the Mine-owned dwelling “WA”. The AQMP also lists the Smith (45) dwelling as the proposed air quality monitoring location for DG11. However, due to access restrictions, this monitoring site was re-located to the land to the north-east of the Smith property, on the northern side of Wilpinjong Creek (Figure 4a).



Condition 18, Schedule 3 of the Project Approval stipulates the criteria for deposited dust, PM<sub>10</sub> and TSP, as shown in Table 15. Table 16 shows WCPL internal air quality performance criteria.

**Table 15  
Relevant Air Quality Criteria**

Pollutant	Averaging Period	Maximum Increase (from the Mine)	Maximum (from all sources)
Deposited dust	Annual	2 g/m <sup>2</sup> /month <sup>1</sup>	4 g/m <sup>2</sup> /month
PM <sub>10</sub>	Annual	-	30 µg/m <sup>3</sup>
PM <sub>10</sub>	24 hour	-	50 µg/m <sup>3</sup>
TSP	Annual	-	90 µg/m <sup>3</sup>

g/m<sup>2</sup>/month = grams per square metre per month

µg/m<sup>3</sup> = micrograms per cubic metre

**Table 16  
Internal Air Quality Performance Indicators**

Pollutant	Monitoring Point	Averaging Period	Performance Indicator <sup>1</sup>
Deposited dust	DDG <sup>2</sup>	Annual	3 g/m <sup>2</sup> /month <sup>3</sup>
PM <sub>10</sub>	HV1, HV2, HV3 HV4 <sup>3</sup>	24 Hour	37.5 µg/m <sup>3</sup>
		Annual	25 µg/m <sup>3</sup>
	TEOM1, TEOM2 <sup>4</sup>	24 hour	50 µg/m <sup>3</sup>

<sup>1</sup> Indicative performance indicators only – to be reviewed and updated with ongoing monitoring results and operational experience

<sup>2</sup> DDG = Depositional Dust Gauge.

<sup>3</sup> HV = High Volume Air Sampler.

<sup>4</sup> TEOM = Tapered Element Oscillating Microbalance.

g/m<sup>2</sup>/month = grams per square metre per month

µg/m<sup>3</sup> = micrograms per cubic metre

### **Effectiveness of the Control Strategies**

Dust control measures were implemented during the reporting period in accordance with the MOP and AQMP. All active haul roads and traffic areas were watered on an ongoing basis using water carts. Water spray were utilised on product stockpiles and the ROM bin, and recently stripped areas and topsoil stockpiles were watered. All these methods were utilised to minimise the generation of dust. In addition, the area disturbed by active mining was minimised as far as practicable. These controls were adequate to control dust generation proximal from the Mine during the reporting period. As demonstrated by the environmental performance measures discussed below.

### 3.4.2 Environmental Performance

#### *Deposited Dust*

Mean monthly dust deposition data for the reporting period is summarised in Table 17. Records of dust deposition data for the reporting period is provided in Appendix A.

**Table 17**  
**Summary of Mean Monthly Dust Deposition Data<sup>1</sup>**

	DG2	DG4	DG5	DG8	DG10	DG11	DG12	DG13	DG14
Insoluble Matter (g/m <sup>2</sup> /month)	1.2	0.9	1.4	0.9	3.0	1.3	3.7	2.0	1.9

Source: ALS (2012)

<sup>1</sup> Monitoring locations are shown on Figure 4a.

Dust deposition results for the reporting period were below the Project Approval long-term impact assessment criteria for annual maximum total deposited dust levels of 4 g/m<sup>2</sup>/month (averaged over a 12 month period) for all sites.

The Office of Environment and Heritage removed the 4gm/m<sup>2</sup>/month dust depositional limit from DG2, DG4, DG8, DG10 and DG11 depositional dust gauges monitoring locations. These limits were removed as the gauges are now situated on mined owned land and no longer represent sensitive locations. The 4gm/m<sup>2</sup>/month dust depositional limit has been removed from DG12, DG13 and DG14 depositional dust gauges monitoring locations. These limits were removed as the gauges monitor Aboriginal art sites not human health. DG5 still has the 4gm/m<sup>2</sup>/month dust depositional limit as this gauge is located in Wollar.

The Office of Environment and Heritage removed the following depositional dust gauges, DDG3 and DDG9 from the EPL. These gauges were removed as they are situated on mined owned land and no longer represent sensitive locations.

It was noted during the reporting period that average dust levels at DG10, DG12 and DG14 were trending above the criteria for annual maximum total deposited dust levels. Upon identification of this trend, the air quality monitoring protocol was implemented. The investigation involved consideration of previous monitoring results in conjunction with prevailing and preceding conditions relevant to the location of DG10, DG12 and DG14. The investigations concluded the following:

- DG10 – High dust concentrations were monitored in January (6.3 g/m<sup>2</sup>/mth), May (5.4 g/m<sup>2</sup>/mth) and June (7.9 g/m<sup>2</sup>/mth). This was caused by cattle grazing in the paddock surrounding the dust gauge. Once the cattle were removed from the paddock monitored dust concentrations returned to normalised levels.
- DG12 – Annual average dust concentrations were influenced by mining moving closer to DG12. A Targeted Action Response Plan (TARP) is being put together in consultation with North East Wiradjuri representatives. However, it is thought that there is no impact on the rock art site. Prior to these events annual dust concentrations were around 2.0g/m<sup>2</sup>/month.
- DG14 – A dust concentration of 6.8 and 5.2 g/m<sup>2</sup>/month was recorded in March and May respectively. These values are considered spurious as it is not supported by the levels recorded by surrounding depositional dust gauges i.e.: DG13 which monitored levels of 1.5 & 1.3 g/m<sup>2</sup>/month in March and May respectively. If these values were replaced by the average monthly concentration value, the annual average would have been 2.9 g/m<sup>2</sup>/month.

The EIS concluded that the *annual average background dust deposition rate is 1.5 g/m<sup>2</sup>/month*. Comparison of the dust deposition results with the reported pre-mining dust deposition rate indicates that the Mine is also complying with the Project Approval criteria of a maximum increase of 2 g/m<sup>2</sup>/month from the Mine.

Figure 4b shows the 12 monthly average for each DDG since June 2006.

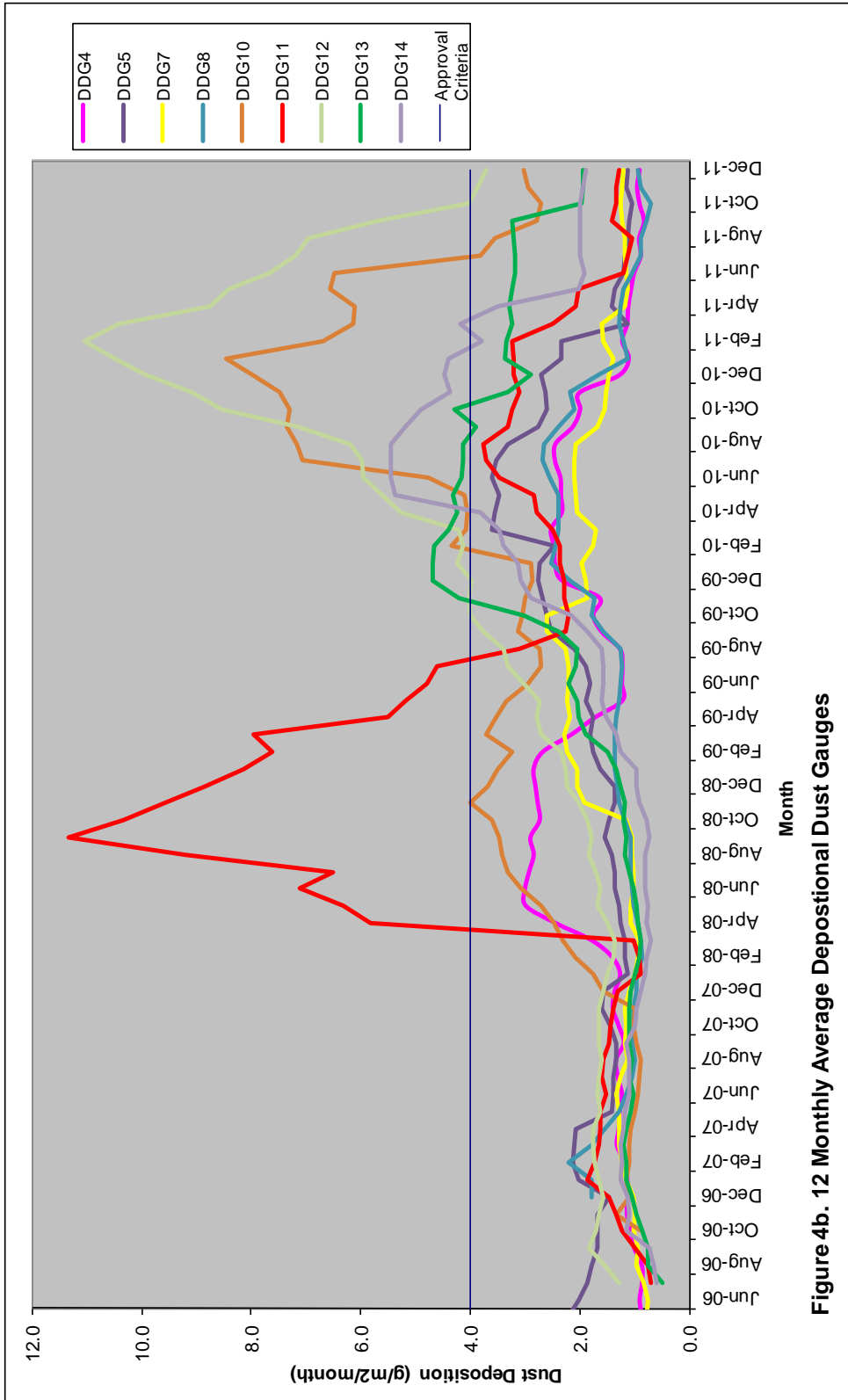


Figure 4b. 12 Monthly Average Depositional Dust Gauges

**PM<sub>10</sub> and TSP**

Four high volume air samplers (HV) and two Tapered Element Oscillating Microbalances (TEOM) were utilised to monitor particulate matter during the reporting period. The results are summarised in Table 18.

**Table 18  
Summary of High Volume Air Sampler and TEOM Data**

	Monitoring Locations <sup>1</sup>					
	HV1	HV2	HV3	HV4 <sup>2</sup>	TEOM1	TEOM2 <sup>^</sup>
PM <sub>10</sub> (µg/m <sup>3</sup> ) recorded range*	2.5 – 21.9	2.6 – 33.7		1.0 – 25.2	3.2 – 34.1	0.2 – 44.6
PM <sub>10</sub> (µg/m <sup>3</sup> ) annual average	9.97	13.56		10.73	12.3	9.4
TSP (µg/m <sup>3</sup> ) recorded range*			6.5 – 39.9			
TSP (µg/m <sup>3</sup> ) annual average			19.39			

Source: ALS (2011), Advitech (2011)

<sup>^</sup> TEOM2 was installed in October 2010 and is for management purposes only. There are no licensing conditions associated with this equipment.

\* Data presented is the range of maximum 24 hour averages.

<sup>1</sup> Monitoring locations are shown on Figure 4a.

<sup>2</sup> Monitoring location formerly referred to as the "Robinson" dwelling, now owned by WCPL.

HV = high volume air sampler

The measured maximum 24 hour average PM<sub>10</sub> concentrations at all sites did not exceed the 50 µg/m<sup>3</sup> short-term impact assessment criterion for particulate matter on any occasion during the reporting period.

The average annual PM10 concentrations recorded at HV1 (9.97 µg/m<sup>3</sup>), HV2 (13.56 µg/m<sup>3</sup>), HV4 (10.73 µg/m<sup>3</sup>) and TEOM1 (12.3 µg/m<sup>3</sup>) were below the criteria limit of 30 µg/m<sup>3</sup> for average annual PM10 concentrations.

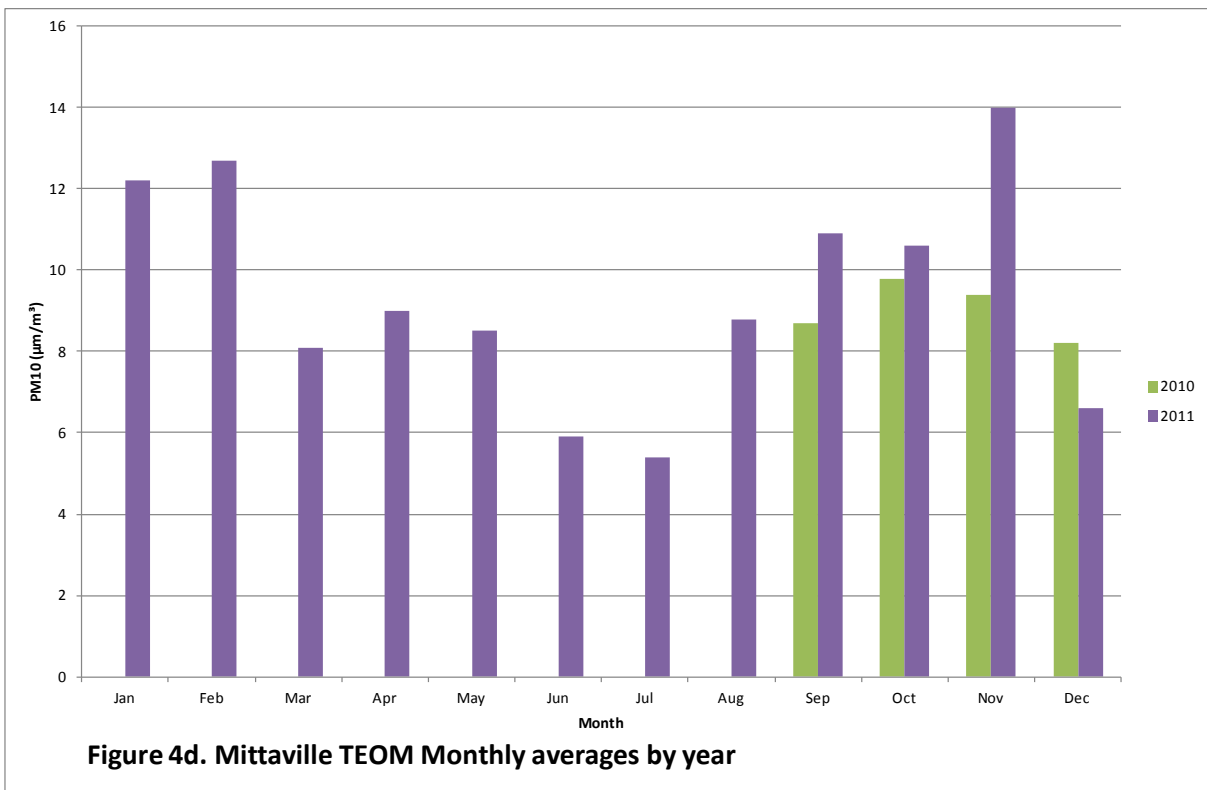
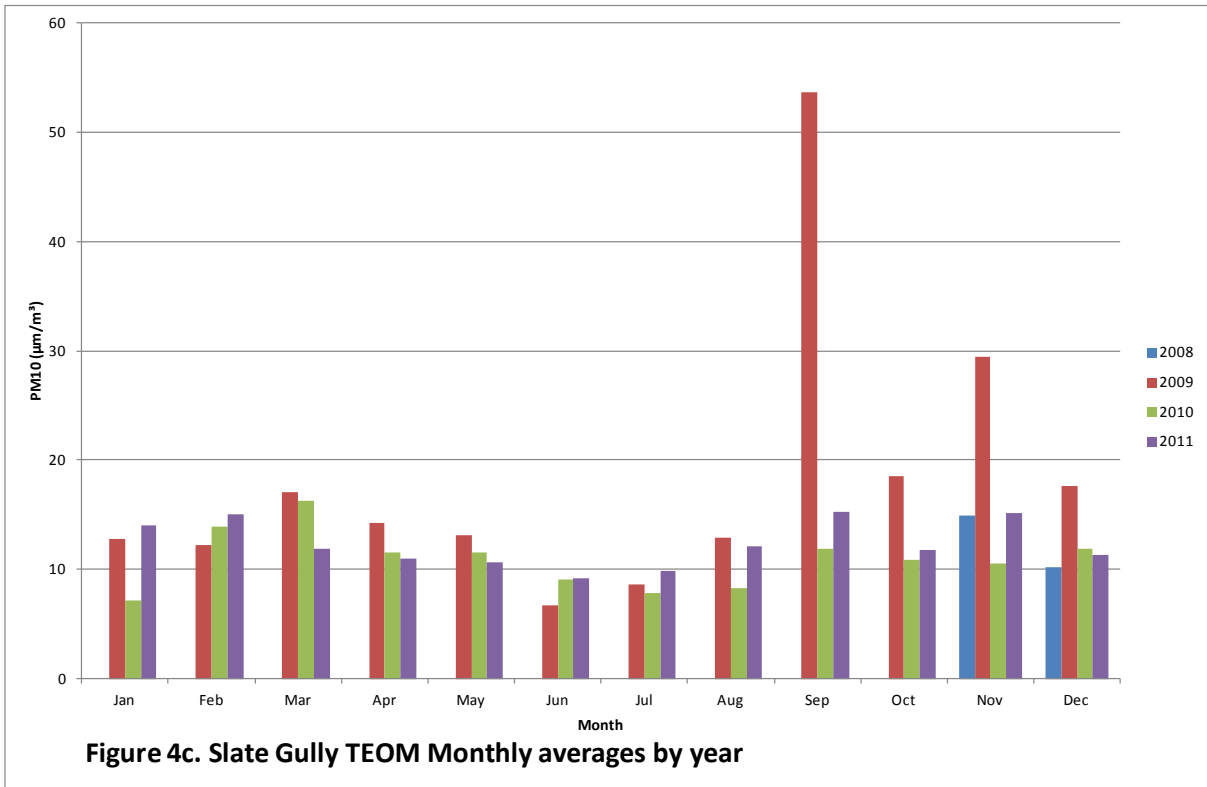
Average annual TSP concentrations recorded at HV3 (19.39 µg/m<sup>3</sup>) was below the criteria limit of 90 µg/m<sup>3</sup> for average annual TSP concentrations.

Figure 4c shows the monthly average PM10 concentration for TEOM1 (Slate Gully) since its commissioning in November 2008.

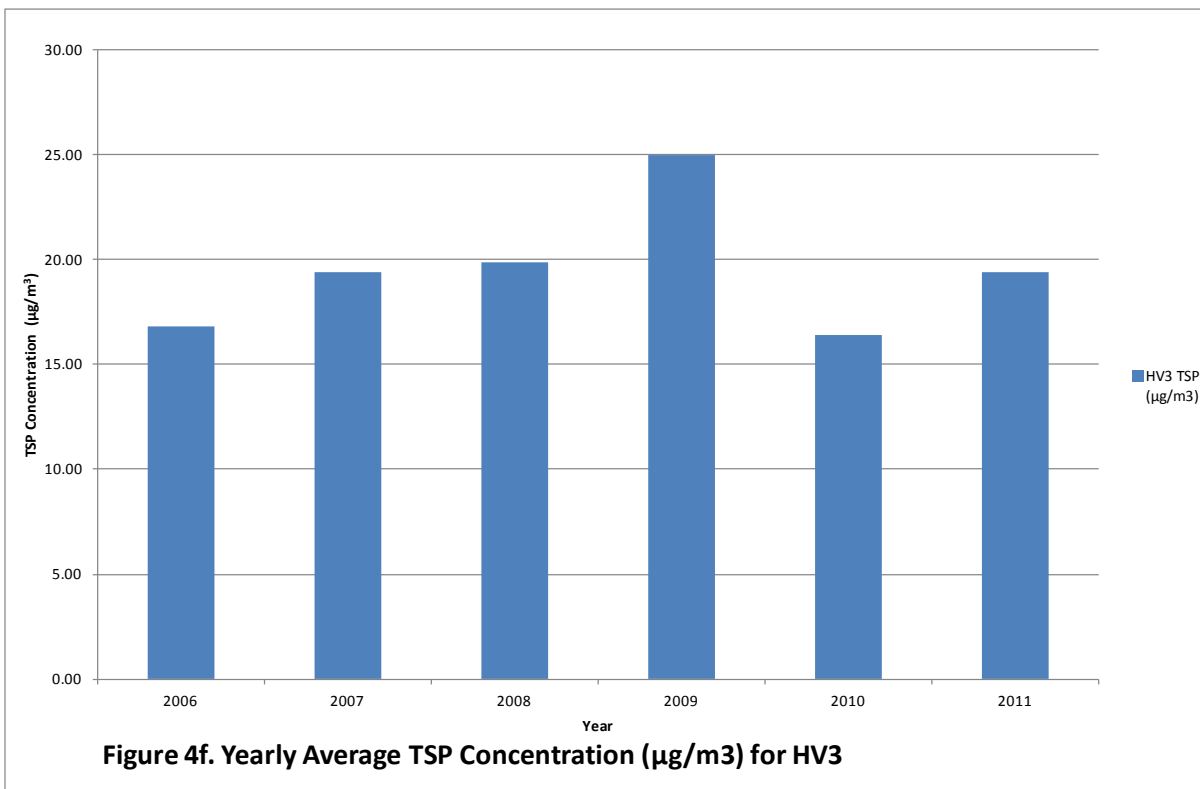
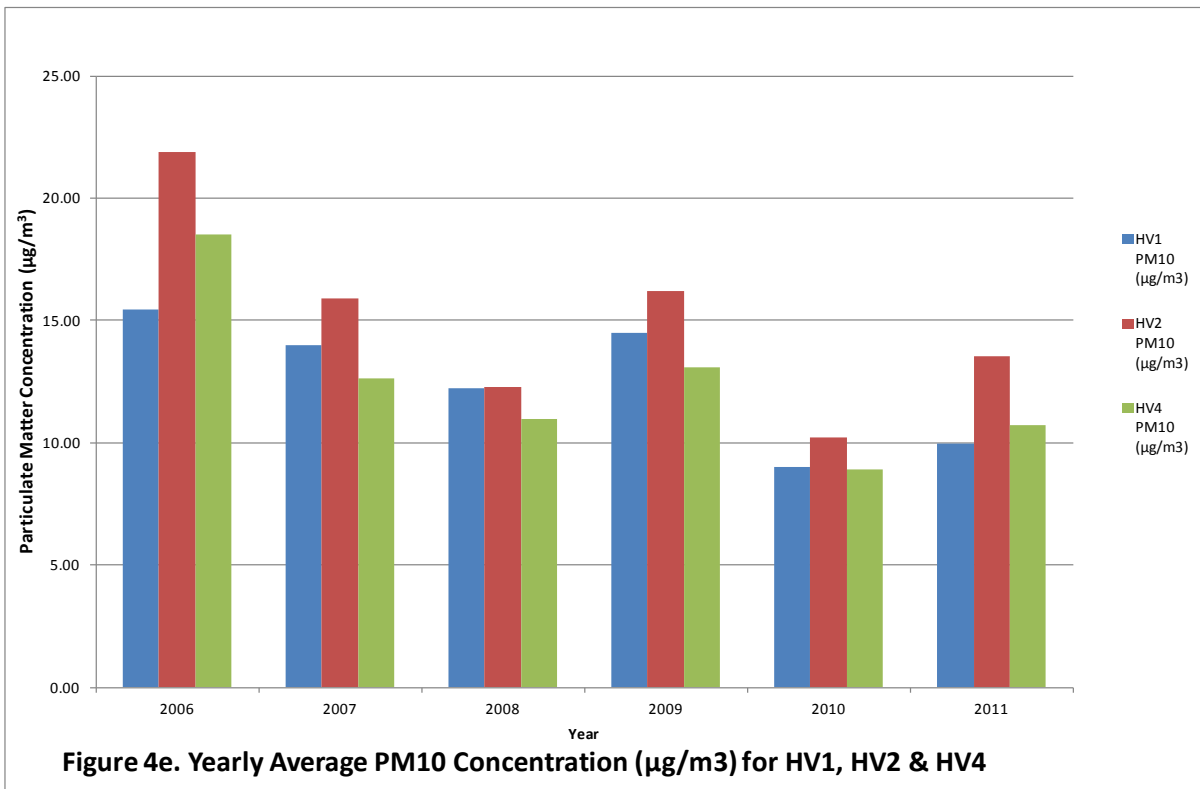
Figure 4d shows the monthly average PM10 concentration for TEOM2 (Mittaville) since its commissioning in August 2010.

Figure 4e shows the annual average PM10 concentration for HV1, HV2, and HV4 since their commissioning in 2006.

Figure 4f shows the annual average TSP concentration for HV3 since its commissioning in 2006.







### Monitoring – Greenhouse Gas

Greenhouse gas emissions as a result of the Mine during the reporting period were primarily associated with:

- Combustion of diesel fuel;
- Use of electricity; and
- Fugitive emissions of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) as the coal is mined.

Greenhouse gas emission estimates for the reporting period are provided in Table 19.

**Table 19**  
**Estimated Mine Greenhouse Gas Emissions**

Year	ROM Coal (Mt)	Electricity Consumed (kWh)	Diesel Consumed (kL)	CO <sub>2</sub> -e Electricity Usage (t)*	CO <sub>2</sub> -e Diesel Usage (t)*	CO <sub>2</sub> -e Fugitive Emissions (t) <sup>#</sup>	Total CO <sub>2</sub> -e Emissions (t)*
2006	0.76	112,292	1,972	111	5,322	912	6,234
2007	4.9	8,235,025	9,753	8,975	29,257	5,880	43,932
2008	8.15	14,677,786	11,815	13,063	31,559	9,780	54,402
2009	12.68	15,867,630	12,923	14,123	34,549	15,216	63,888
2010	10.05	21,956,191	18,163	19,542	49,039	12,060	80,641

Source: Thiess (2012) and CarbonView™ (2012)

\* Emissions calculations conducted in accordance with the provisions of the Department of Climate Change (2008) – Electricity consumption purchased from grid 0.89 kg CO<sub>2</sub>-e/kWh and transport fuel consumption (diesel oil) 69.2 kg CO<sub>2</sub>-e/GJ.

<sup>#</sup> Based on site-specific fugitive emission factor of 1.2 kg CO<sub>2</sub>-e per tonne ROM coal (Holmes Air Sciences, 2005).

KWh = kilowatts per hour

GJ = gigajoule

kL = kilolitre

CO<sub>2</sub>-e = carbon dioxide equivalent

Greenhouse gas abatement measures undertaken for the reporting period included the following:

- Minimisation of fuel usage (i.e. diesel and unleaded petrol) through:
  - Encouragement of staff car pooling;
  - Undertaking plant and equipment maintenance; and
  - Operational practices (e.g. unattended plant is not left idling and is switched off as soon as practicable after use).
- a) Use of solar power for monitoring equipment and investigations into its use for other operations.

### **3.4.3 Reportable Incidents**

No environmental incidents were reported relating to air quality at the Mine during the reporting period. Complaints regarding air quality received during the reporting period were responded to in accordance with the Mine Complaint Response Protocol (Section 4.1).

### **3.4.4 Further Improvements**

In response to the Audit recommendations, WCPL has revised the AQMP during this reporting period, and it is currently under assessment with DoPI. Awareness of the importance of dust management is also targeted through employee education and training (e.g. toolbox meetings and inductions).

A new TEOM was installed on the Mittaville property (WCPL owned land) this is used only as a management tool and has no compliance limits imposed.

A joint Strategic Environmental Compliance and Performance Review on the Management of Dust from Coal Mines, was undertaken by the Department of Environment, Climate Change and Water NSW (DEECW), the NSW Department of Planning (DoPI) and Industry & Investment NSW (DTIRIS). WCPL was one of several mines to be audited. The site visit was conducted on the 9<sup>th</sup> and 10<sup>th</sup> September 2010.

The findings for this review can be found by visiting the following link:

<http://www.environment.nsw.gov.au/resources/licensing/10994coalminedust.pdf>

## **EROSION AND SEDIMENT**

### **3.4.5 Environmental Management**

#### ***Effectiveness of the Control Strategies***

Erosion and sediment control measures were implemented in accordance with the ESCP (approved by the Director-General of the DoPI in February 2006). In accordance with the MOP and ESCP, installation of erosion and sediment control works were undertaken during the reporting period, including the installation of permanent structures for infrastructure components and temporary structures (i.e. sediment dams and silt fences) for other disturbance areas.

The above control strategies were considered adequate to manage erosion and sediment-related risks associated with operations during the reporting period, as demonstrated by the environmental performance measures outlined in Section 3.5.2.

### **3.4.6 Environmental Performance**

#### ***Monitoring***

In accordance with the ESCP, sediment control structures were inspected for capacity on at least a monthly basis as well as following rainfall events of 20 mm or more in a 24 hour period throughout the reporting period.

#### ***Performance Outcomes***

Sediment control structures performed adequately during the year, and specifically after rainfall events experienced in September and November 2011. Water from the sediment control system was recycled on site.

One additional diversion bund was constructed during the reporting period.

### **3.4.7 Reportable Incidents**

No environmental incidents or complaints were reported relating to erosion and sediment control at the Mine during the reporting period.

### **3.4.8 Further Improvements**

In response to the Audit recommendations, WCPL has revised the ESCP during this reporting period, and it is currently under assessment with DoPI. The ESCP will be reviewed and updated as necessary during the next reporting period, so as to provide an accurate template and planning tool for current and future operating conditions, as well as integrate with the drainage aspects of the RMP.

### 3.5 SURFACE WATER

#### 3.5.1 Environmental Management

##### *Effectiveness of the Control Strategies*

Surface water management and mitigation measures were undertaken in accordance with the SWMP (approved by the Director-General of the DoPI in March 2006). WCPL also continued to operate in accordance with the SGWRP, which includes surface water monitoring triggers.

In accordance with the MOP and the SWMP, surface water control structures, works and procedures were implemented during the reporting period. Areas disturbed by active mining were minimised and runoff from catchment areas was isolated and diverted around disturbance areas through the construction of water diversion bunds. Runoff from construction and operation areas was diverted to sediment retention storages across the mine area. Erosion and sediment control measures were also implemented (as described in Section 3.5).

The above control strategies were considered adequate to manage surface water-related risks associated with operations during the reporting period, as demonstrated by the environmental performance measures outlined below.

#### 3.5.2 Environmental Performance

##### *Monitoring*

Table 20 outlines the surface water parameters, monitoring locations and frequency of monitoring recorded for the Mine in accordance with the SWMP. Surface water monitoring locations are shown on Figure 5.

**Table 20  
Summary of the Surface Water Monitoring Programme**

Monitoring Parameter	Monitoring Sites <sup>1</sup>	Frequency
<ul style="list-style-type: none"> <li>pH, EC, turbidity, TSS and SO<sub>4</sub>.</li> </ul>	<ul style="list-style-type: none"> <li>WIL(U), WIL(U2), WIL(PC), WIL(NC), WIL(D), WIL(D2), CC1 to CC3, WOL1 and WOL2.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly and following significant rainfall events (i.e. greater than 20 mm in 24 hours).</li> </ul>
<ul style="list-style-type: none"> <li>Flow rate and EC.</li> </ul>	<ul style="list-style-type: none"> <li>Wilpinjong Creek (upstream and downstream) and Cumbo Creek gauging stations.</li> </ul>	<ul style="list-style-type: none"> <li>Continuous.</li> </ul>
<ul style="list-style-type: none"> <li>pH, EC, turbidity, TSS and SO<sub>4</sub>.</li> </ul>	<ul style="list-style-type: none"> <li>Wilpinjong Creek (upstream and downstream) and Cumbo Creek gauging stations.</li> <li>Site water storages, tailings disposal storages and sediment retention dams.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly.</li> </ul>
<ul style="list-style-type: none"> <li>Water level, pH, EC, turbidity and SO<sub>4</sub>.</li> </ul>	<ul style="list-style-type: none"> <li>Existing waterholes on the McDermott property*.</li> </ul>	<ul style="list-style-type: none"> <li>In consultation with individual landholder.</li> </ul>
<ul style="list-style-type: none"> <li>Stream “health” monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Sections of Wilpinjong Creek and Cumbo Creek.</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> </ul>
<ul style="list-style-type: none"> <li>Channel stability monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Long sections of Wilpinjong Creek and Cumbo Creek will be surveyed along the creek alignment.</li> </ul>	<ul style="list-style-type: none"> <li>Every 5 years.</li> </ul>

<sup>1</sup> Monitoring locations are shown on Figure 5.

\* Now Mined Owned. McDermott property shown on Figure 2.

EC = electrical conductivity; SO<sub>4</sub>: sulphates

Figure 5a shows the yearly average of EC for surface water monitoring sites.

Figure 5b shows the yearly average of pH for surface water monitoring sites.

Figure 5c shows the yearly average of sulphates for surface water monitoring sites.

Figure 5d shows the yearly average of turbidity for surface water monitoring sites.

### Performance Outcomes

#### *pH, SO<sub>4</sub>, and Turbidity*

A summary (i.e. minimum and maximum) of the surface water quality monitoring results for pH, SO<sub>4</sub> and turbidity is provided in Table 21.

**Table 21**  
**Summary of Surface Water Quality Monitoring Data - pH, EC, SO<sub>4</sub> and Turbidity<sup>1</sup>**

Parameter	Surface Water Monitoring Location <sup>2</sup>					
	CC1	CC2	CC3	WIL (U)	WIL (U2)	WIL (NC)
EC (µS/cm)	2,620 – 6,000	2,630 – 5,960	1,500 – 3,700	270 – 1,300	260 – 2,550	1,030 – 4,290
pH (S.I.)	5.7 – 8.3	5.9 – 8.2	6.3 – 8.4	5.5 – 8.5	5.6 – 8.1	5.9 – 7.9
SO <sub>4</sub> (mg/L)	790 – 2,150	789 – 3,030	407 – 1,590	2 – 28	2 – 90	49 – 1,540
Turbidity (NTU)	0.5 – 11.5	0.2 – 2.3	0.3 – 3.8	3.2 – 136	5.8 – 95.3	1.4 – 212
	WIL (PC)	WIL (D)	WIL (D2)	WOL1	WOL2	Baseline <sup>#</sup>
EC (µS/cm)	650 – 2,530	1,200 – 4,000	1,260 – 4,300	1,010 – 2,340	570 – 2,300	185 – 11,000
pH (S.I.)	5.1 – 8.2	6.8 – 8.3	6.3 – 8.2	6.2 – 8.3	6.2 – 8.2	5.8 – 9.1
SO <sub>4</sub> (mg/L)	6 -145	280 – 1,540	298 – 1,580	64 – 664	110 – 393	10 – 2,450
Turbidity (NTU)	5.9 – 112	0.7 – 134	0.7 – 122	1.6 – 121	1.6 – 61.3	

Source: ALS (2012)

<sup>1</sup> For a full set of water quality monitoring results for the reporting period refer to Table B-1, Appendix B.

<sup>2</sup> Monitoring locations are shown on Figure 5.

# Based on baseline range monitoring results specified in WCPL EIS (2005).

Dry Sites were dry during those sampling periods, therefore no samples were taken

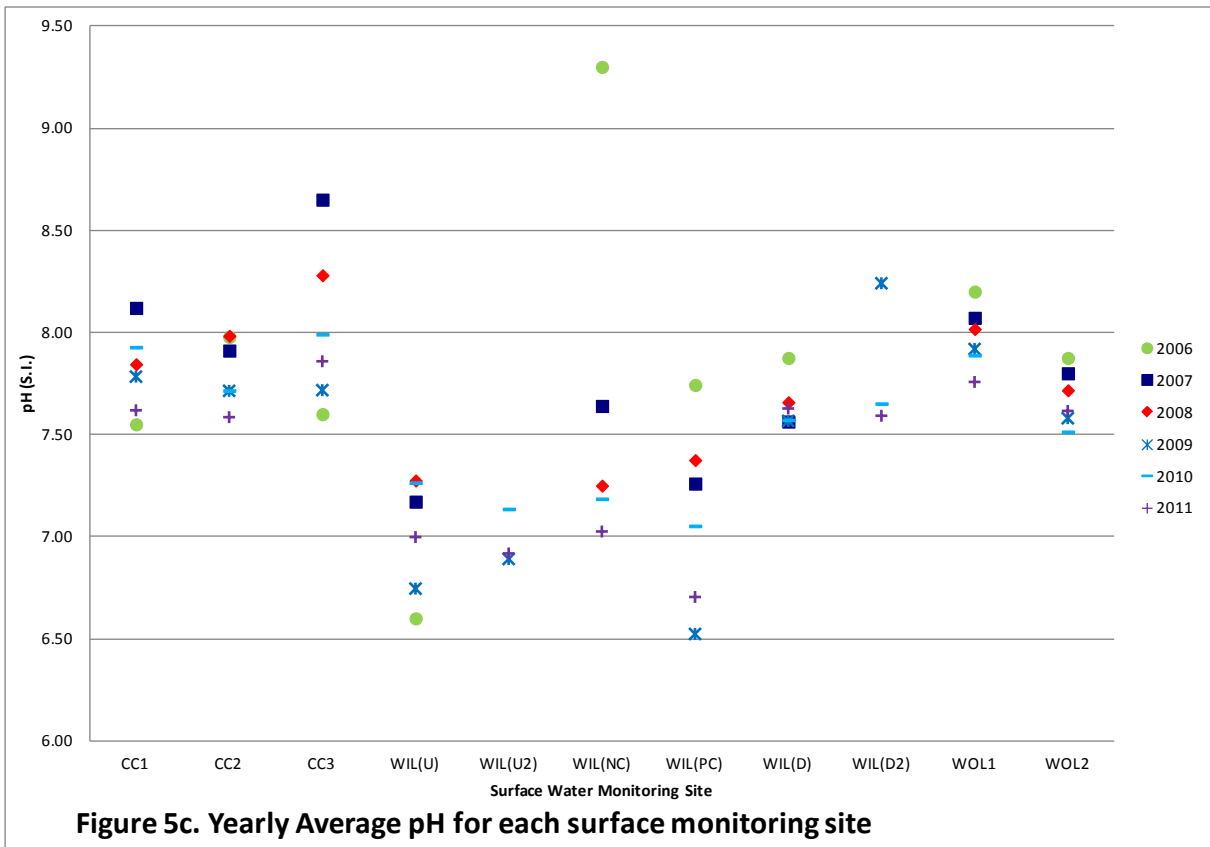
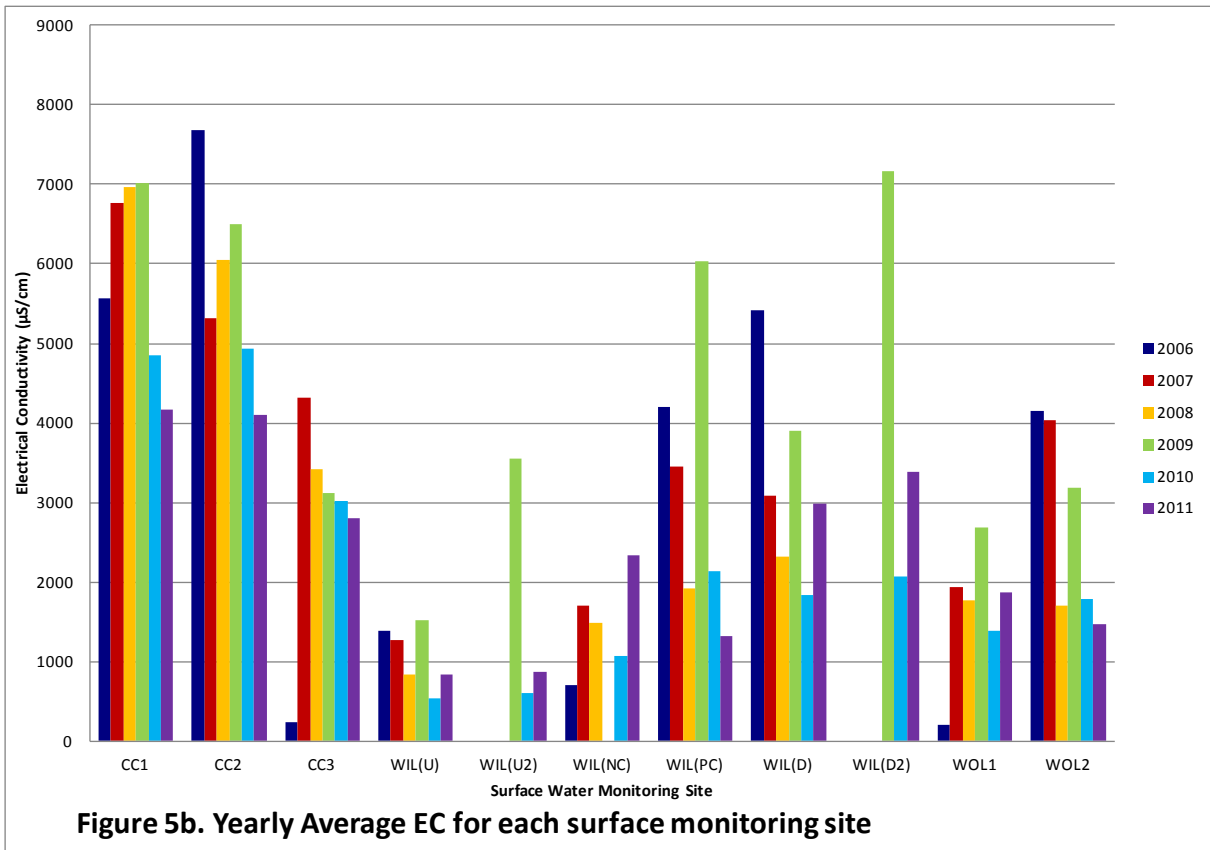
mg/L = milligrams per litre

S.I. = Standard International units

NTU = Nephelometric Turbidity Units

µS/cm = micro Siemens per centimetre







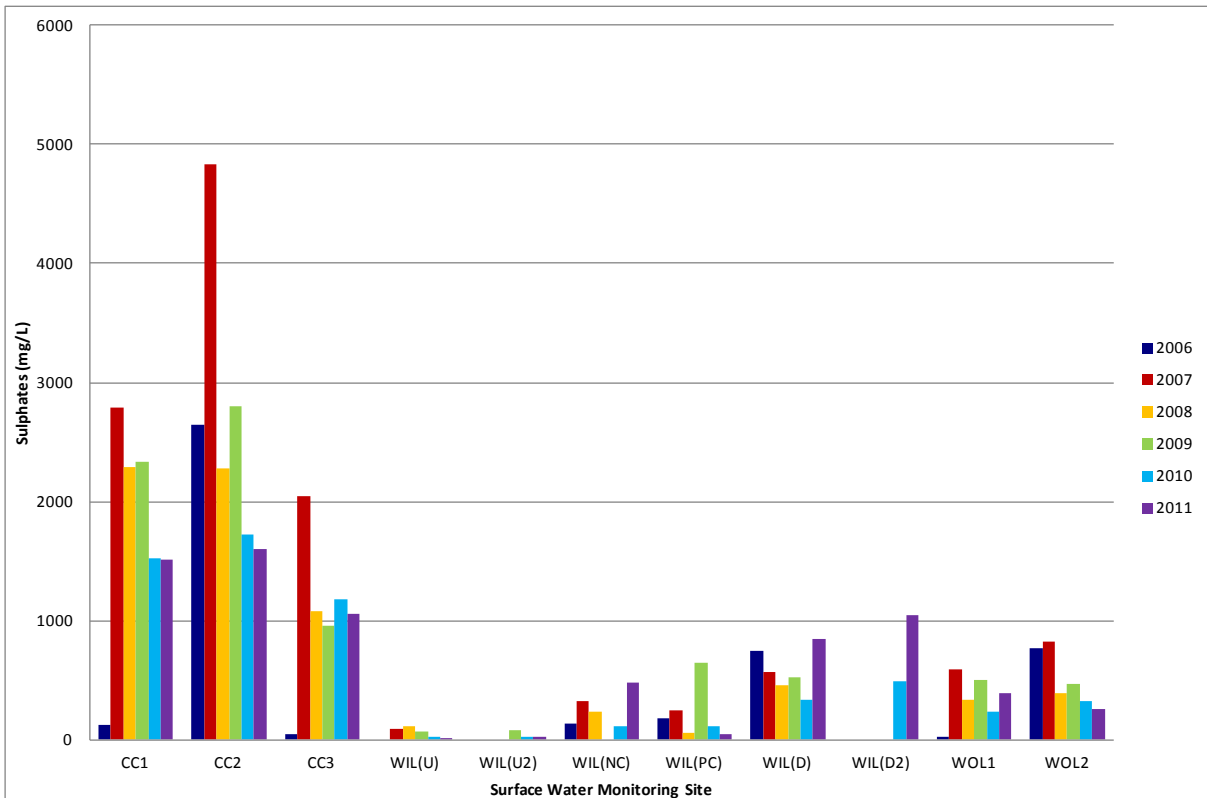


Figure 5d. Yearly Average Sulphates for each surface monitoring site

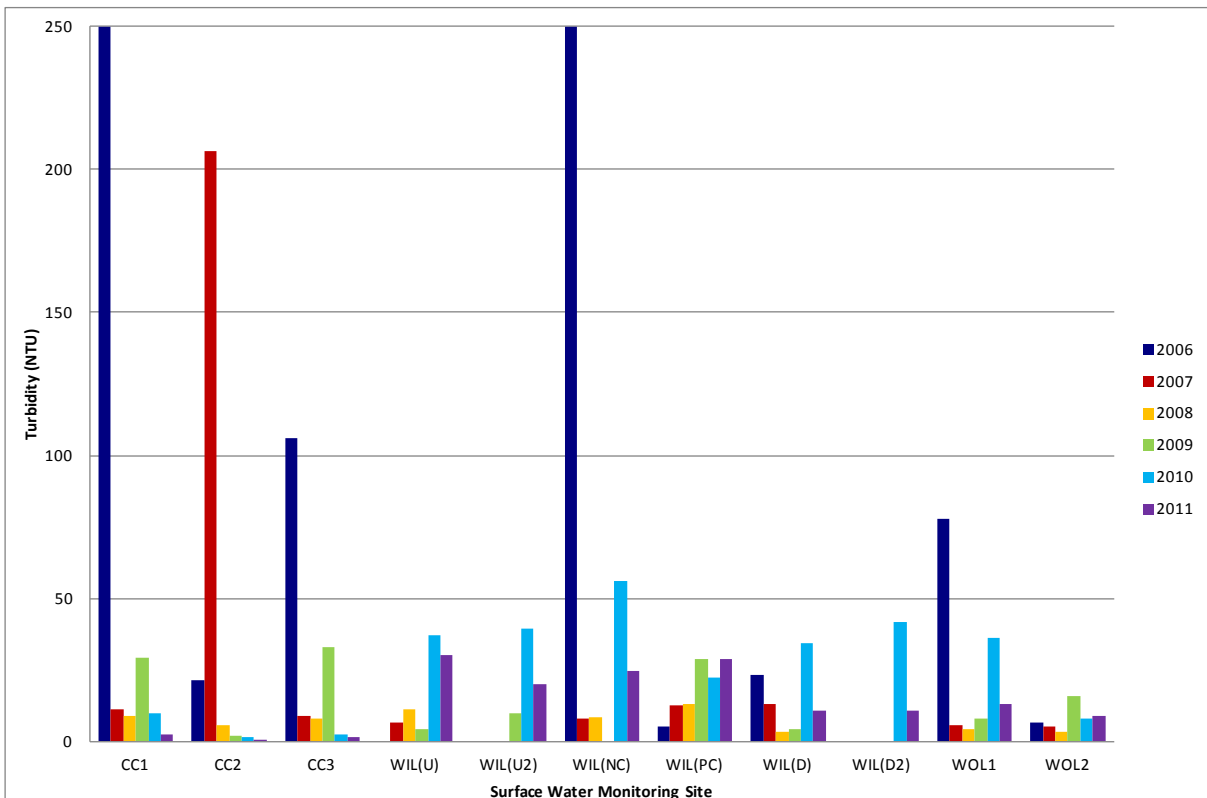


Figure 5e. Yearly Average Turbidity for each surface monitoring site

Surface water quality monitoring data collected during the reporting period for EC and turbidity indicated that results were within baseline ranges. SO<sub>4</sub> results also within baseline ranges in Wilpinjong Creek. Cumbo Creek SO<sub>4</sub> recorded levels were outside the Baseline range; this is the fifth year in which this has occurred. These readings are considered to be natural fluctuations as there has been no mining related impact on this creek system. Monitoring results from Surface Water monitoring sites CC1, WIL(U), WIL(U2) and WIL(PC) were generally within the relevant groundwater impact assessment criteria for pH (~0.5 above or below the baseline range).

#### *On-site Water Storages*

Monitoring of pH, turbidity, EC and SO<sub>4</sub> at the on-site water storages (e.g. clean water dam and recycled water dam) and sediment retention dams was undertaken during the reporting period. Monitoring results are presented in Table B-2, Appendix B.

#### *Flow Rate and EC*

The mine operated three gauging stations throughout the reporting period. The stations are located upstream and downstream of the mining lease on Wilpinjong Creek and on Cumbo Creek upstream of the confluence with Wilpinjong Creek (figure 5). The stations monitor flow and EC on 15 minutes intervals (Figures 6a, 6b and 6c). As indicated on Figures 6a, 6b and 6c, there were several gaps in the EC data at the Upstream and Downstream Wilpinjong stations and the Cumbo Creek station. Each gap in EC data can be attributed to monitoring equipment failure.

WCPL upgraded both Upstream and Downstream Wilpinjong Creek gauging stations in November.

Figures 6a, 6b and 6c (Wilpinjong Creek upstream, downstream and Cumbo Creek gauging stations) all demonstrate typical significant reductions in EC following rainfall and surface flow events throughout the reporting period.

During the reporting period the downstream Wilpinjong Creek flows were compared to the following stream flow triggers in accordance with the SGWRP (Section 3.7.4).

- Flow Volume Percentage, calculated as the ratio of recorded total flow for the preceding 12-month period compared to the model predicted total flow for the preceding 12-month period. Trigger for investigation is if the ratio falls below 80%.
- Cease-to-Flow Percentage, calculated as the ratio of recorded cease-to-flow days for the preceding 12-month period to the model predicted cease-to-flow days for the preceding 12-month period. Trigger for investigation is if the ratio fall below 80%.

The flow volume percentage ratio did not fall below 80% during the reporting period (figure 6d). No investigations were required.

The Cease-to-Flow percentage did not fall below 80% during the reporting period. (Figure 6g). No investigations were required.

Data for the Upstream Wilpinjong Creek gauging station between May and November 2011 was unable to be collected due to failure of the station.

Figure 6e shows in November an anomaly in the actual flow vs. modelled flow which is due to the purging gas cylinder running out of gas during the flow event.

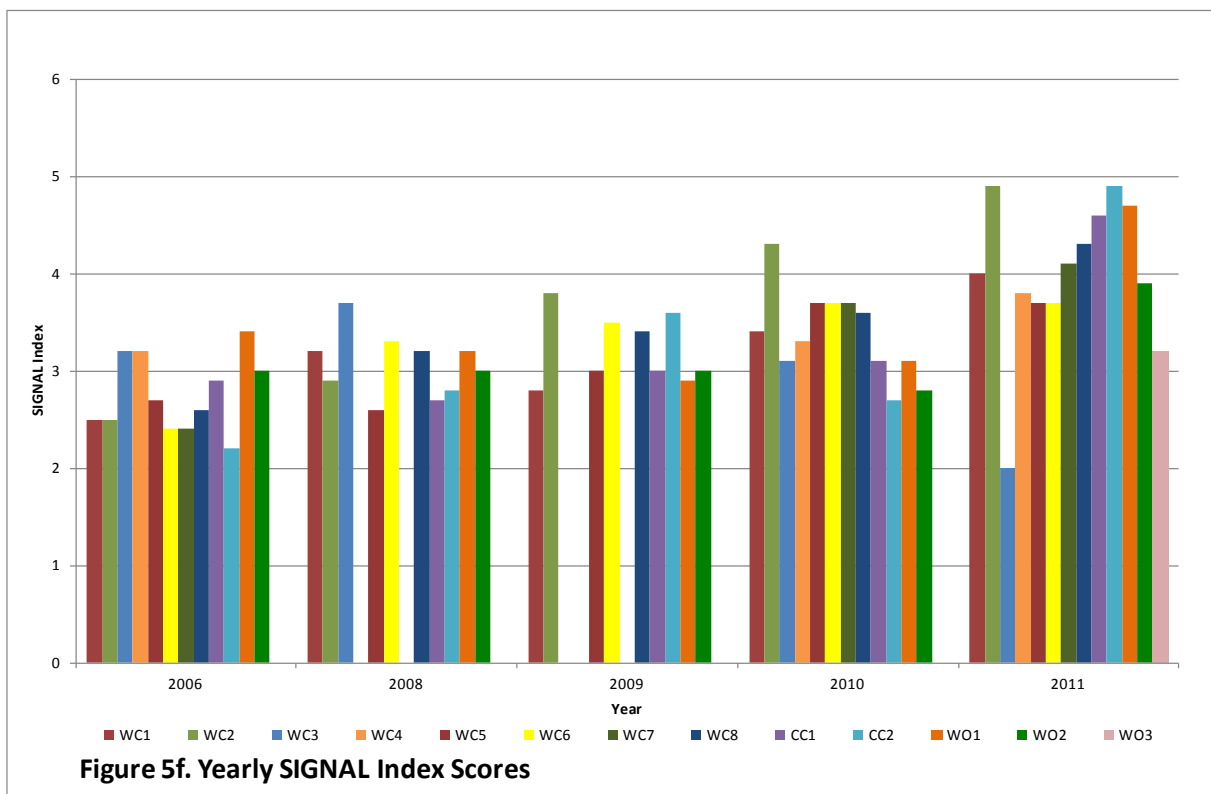
Both Upstream and Downstream Wilpinjong Creek gauging stations have been upgraded and integrated with the Sentinex system.

*Stream Health Monitoring*

In accordance with the SWMP, stream health monitoring was undertaken by Bio-Analysis during the reporting period. The findings of the report remain consistent with those drawn in the 2006, 2008, 2009 and 2010 reports. These reports cover both pre mining conditions and when mining has commenced. The 2007 stream health report was abandoned after heavy rainfalls caused high and unsafe flows in both Wilpinjong and Cumbo Creeks. The 2011 Stream Health Monitoring Report is presented in Appendix C.

Wilpinjong Creek and Cumbo Creek are both classified as being “severely polluted” when using the SIGNAL index for macro invertebrate abundance (Figure 5f). Stream health is also considered to be “very poor”. SIGNAL index scores of <4 is severely polluted; 4-5 is moderately polluted; 5-6 is mildly polluted; and >6 is healthy.

Sampling was conducted in the period 12-17 September. There had been a minor fresh in the creeks a few days prior to sampling and flow rates were still decreasing to a relatively steady base flow during the sampling period.



*Channel Stability Monitoring*

In accordance with the SWMP, channel stability monitoring along Wilpinjong Creek and Cumbo Creek has been rescheduled to be undertaken at 5 yearly intervals, following an in principal agreement from DoPI. During the reporting period, ad hoc visual monitoring of the channels has identified little to no change in stability, although creek banks are continuing to revegetate naturally. This was mostly likely attributable to the exclusion of stock from riparian areas. Whilst re-establishment of the riparian zone is still in the early stages, it is anticipated that bank stability along both creeks will continue to improve as vegetation establishes.

### **3.5.3 Reportable Incidents**

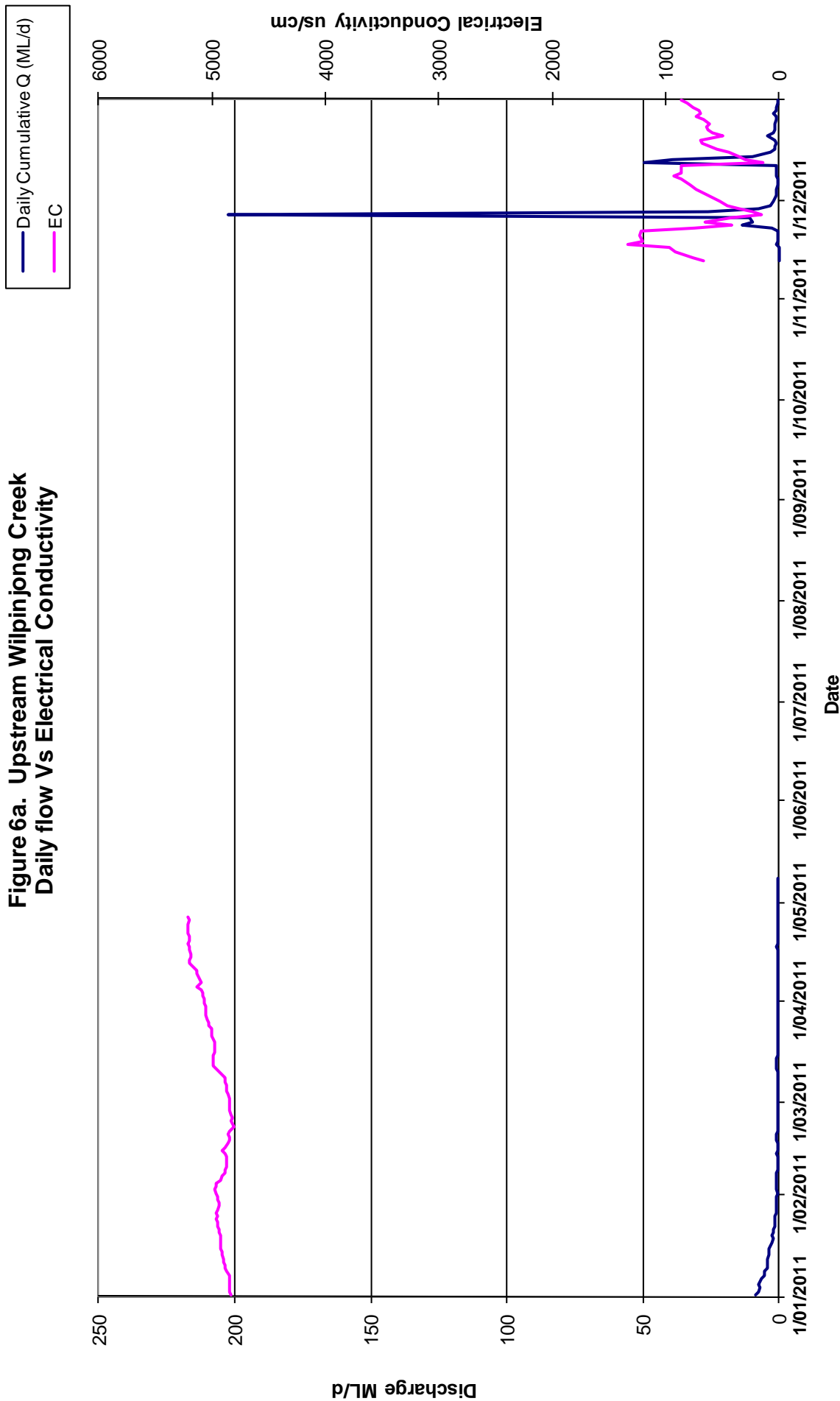
No environmental incidents or complaints were reported regarding surface water management at the Mine during the reporting period.

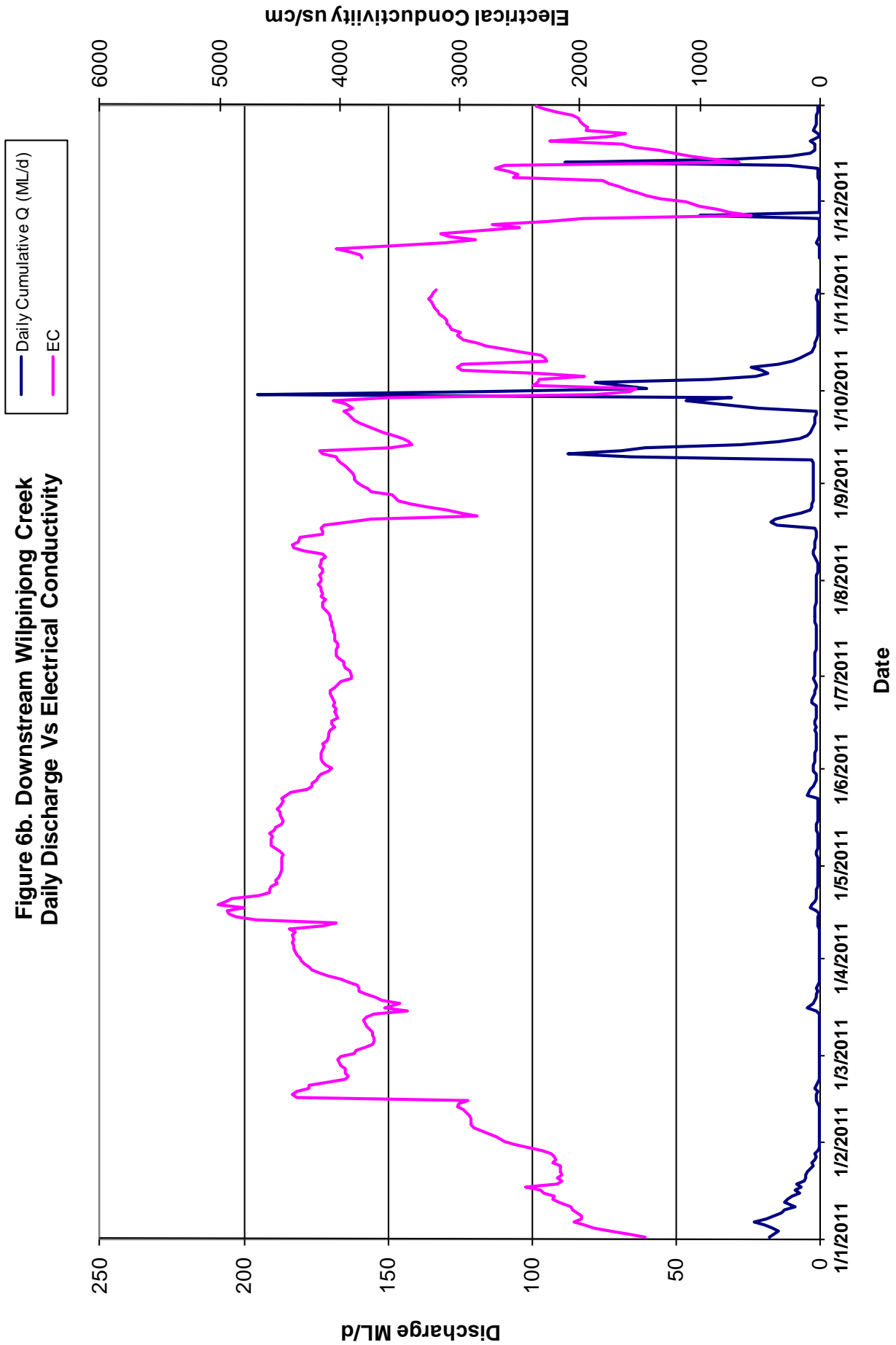
### **3.5.4 Further Improvements**

Six evaporators were removed from adjacent to Pit 2. These were operated to evaporate as much water as possible, as the levels of water in WCPL storages were reaching close to 100%.

In response to the Audit recommendations, the Surface Water Management Plan (SWMP) (including the Surface Water Management and Monitoring Plan (SWMMP and Site Water Balance (SWB)) have been reviewed during this reporting period. The SWB has been reviewed and updated as necessary to reflect water management on site. The SWMP has also been reviewed and updated in this reporting period and awaiting approval from DoPI.

**Figure 6a. Upstream Wilpinjong Creek  
Daily flow Vs Electrical Conductivity**





**Figure 6c. Cumbo Creek  
Daily Flow Vs Electrical Conductivity**

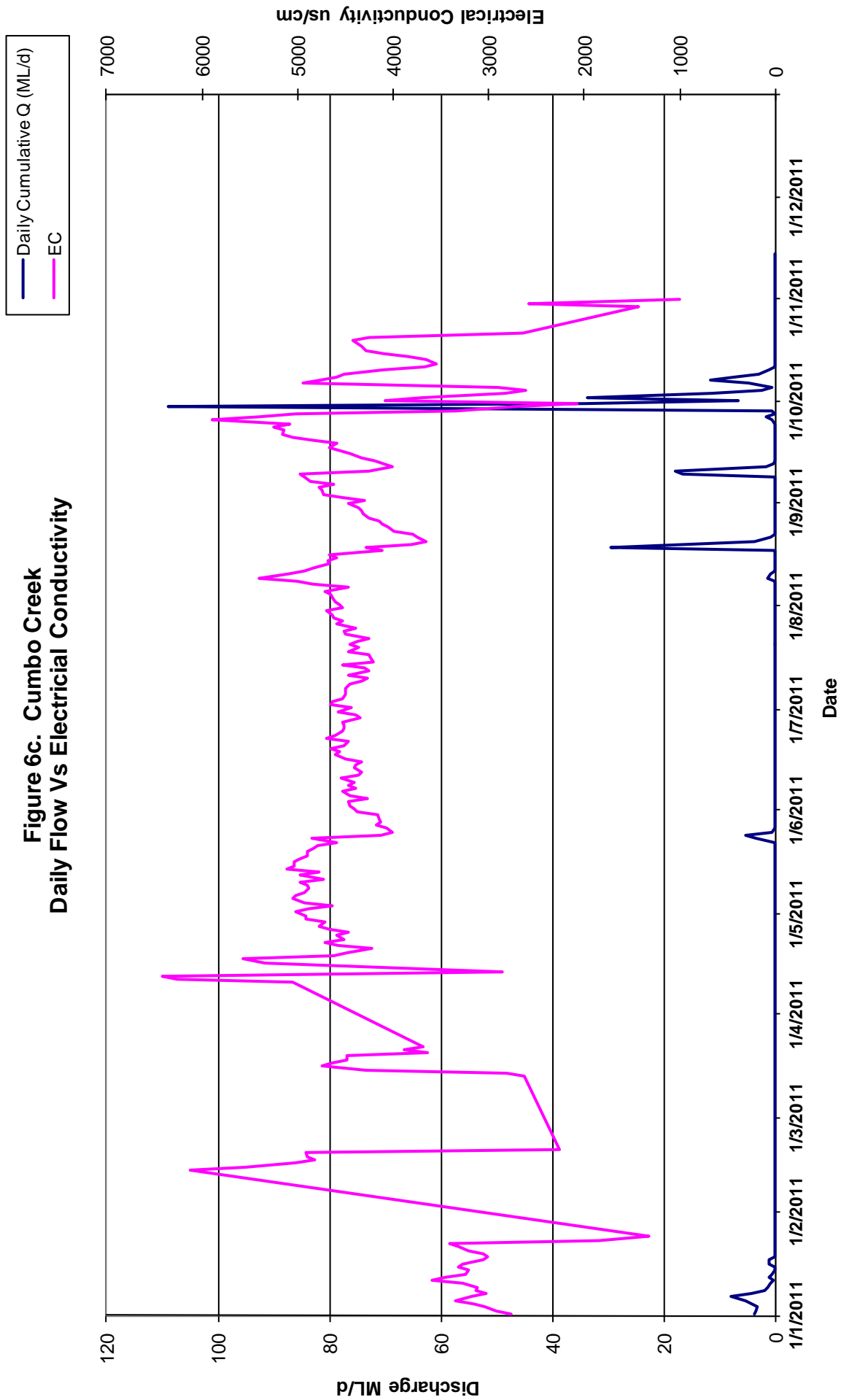


Figure 6d. 2011 Wilpinjong Creek Flow Volume Percentage.

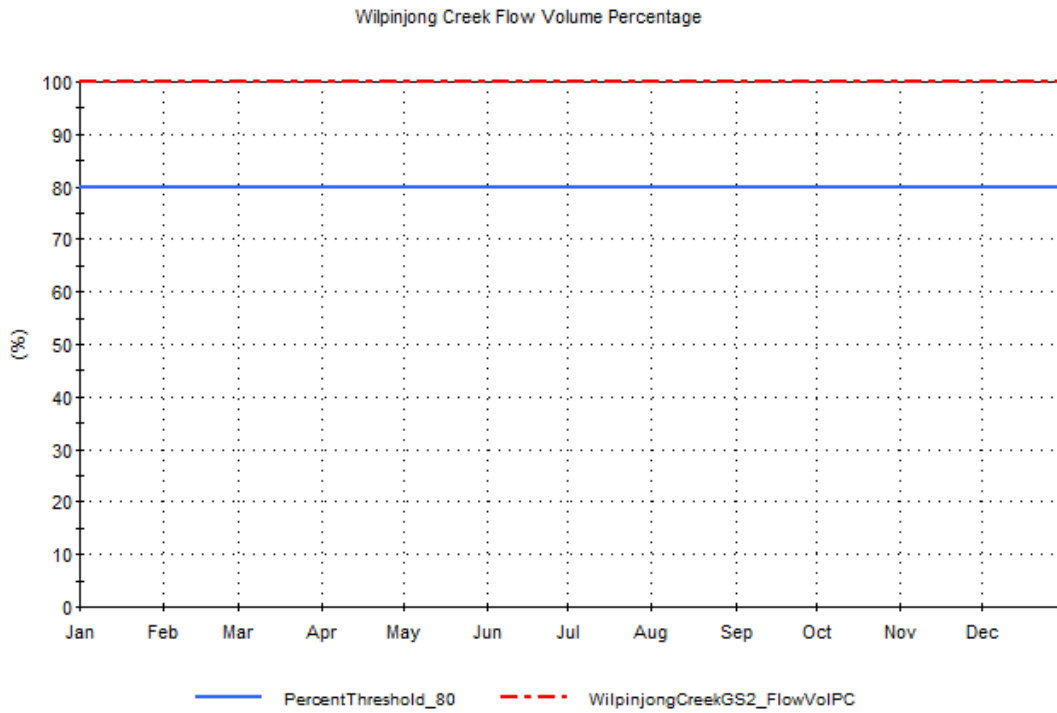
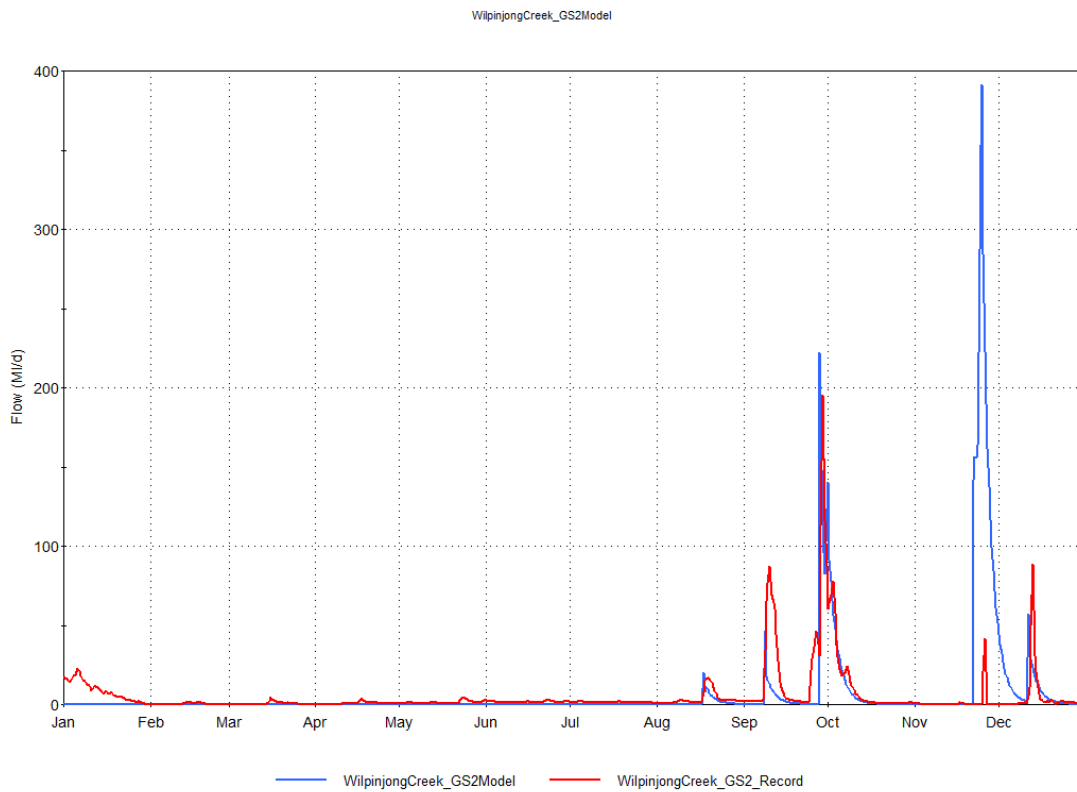
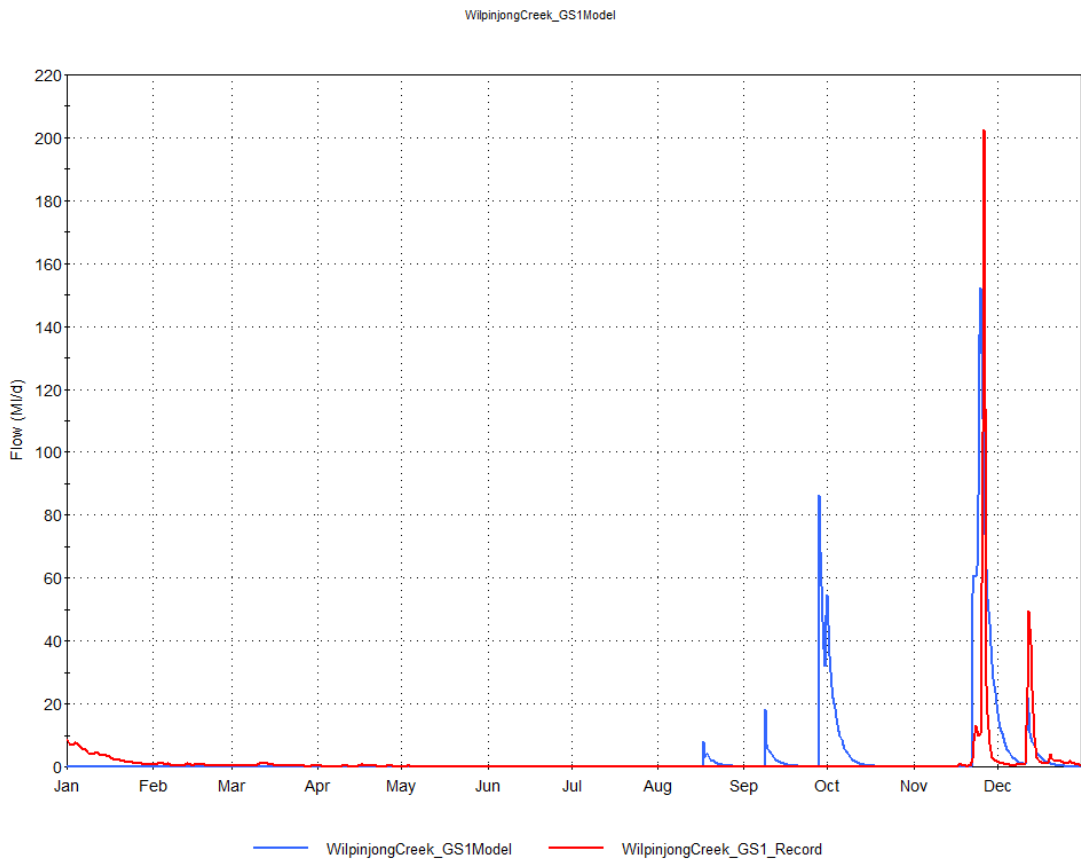


Figure 6e. 2011 Downstream Wilpinjong Creek Actual Flow Vs Modelled Flow

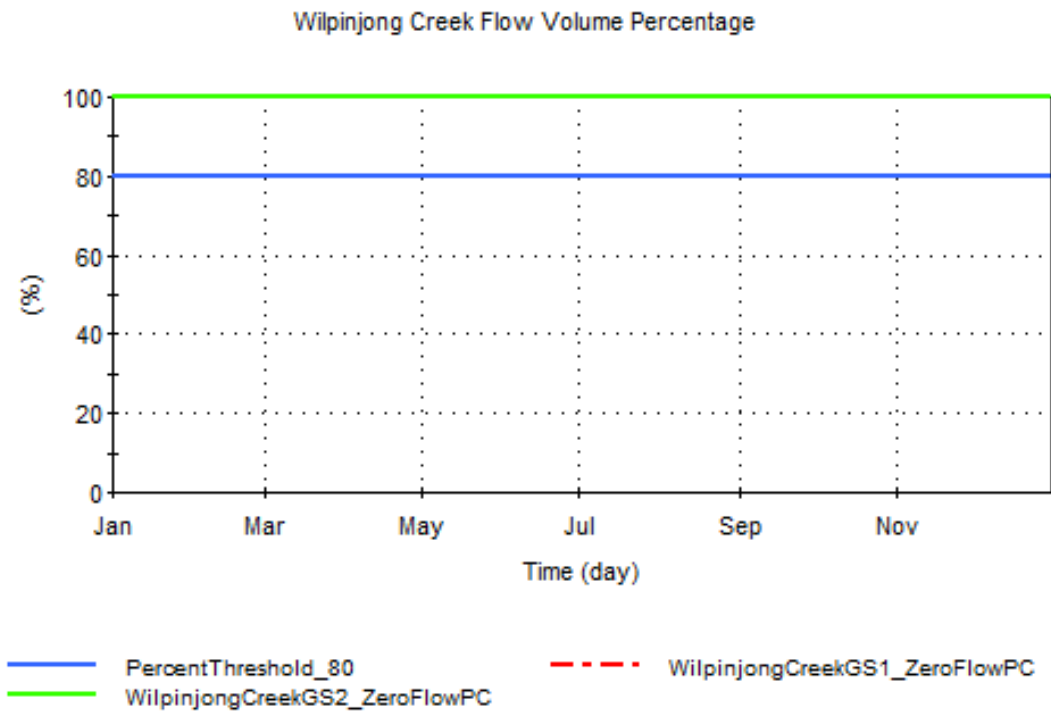




**Figure 6f. 2011 Upstream Wilpinjong Creek Actual Flow Vs Modelled Flow**



**Figure 6g. 2011 Cease to flow percentage.**



### 3.6 GROUNDWATER

#### 3.6.1 Environmental Management

##### *Effectiveness of the Control Strategies*

Groundwater management and mitigation measures were undertaken in accordance with GMP (approved by the Director-General of the DoPI in February 2006). The SGWRP developed as part of the SWMP also includes groundwater monitoring triggers.

In accordance with the MOP and SWMP, the control strategies implemented were considered adequate to manage groundwater-related risks associated with operations during the reporting period.

#### 3.6.2 Environmental Performance

##### *Monitoring*

Table 22 outlines the groundwater parameters, monitoring locations and frequency of monitoring recorded for the Mine in accordance with the GMP. Groundwater monitoring locations are shown on Figure 5.

**Table 22  
Summary of the Groundwater Monitoring Programme**

Monitoring Parameter	Monitoring Sites <sup>1</sup>	Frequency
<ul style="list-style-type: none"> <li>Water level, field pH, EC and volume of water extracted.</li> </ul>	<ul style="list-style-type: none"> <li>Open Cut Operations – Main pit sump(s).</li> <li>Open Cut Operations – Dewatering Bores.</li> <li>Water Supply Bores – GWs1 to GWs19.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly.</li> </ul>
<ul style="list-style-type: none"> <li>Na, K, Mg, Ca, Cl, HCO<sub>3</sub>, SO<sub>4</sub>, Total Fe.</li> </ul>	<ul style="list-style-type: none"> <li>Wilpinjong Creek – GWa1 to GWa4, GWa7 (Alluvium), GWc1 and GWc2 (Coal Measures).</li> <li>Cumbo Creek – GWa5 and GWa6 (Alluvium) and GWc3 (Coal Measure).</li> <li>Wollar Creek – GWc4 (Coal Measures).</li> <li>Wollar Village – GWa8 (Alluvium) and GWc5 (Coal Measures).</li> </ul>	<ul style="list-style-type: none"> <li>Every six months.</li> </ul>
<ul style="list-style-type: none"> <li>Water level, field pH and EC.</li> </ul>	<ul style="list-style-type: none"> <li>Wilpinjong Creek – GWa1 to GWa4 and GWa7 (Alluvium) and GWc1 and GWc2 (Coal Measures).</li> <li>Cumbo Creek – Gwa5 and GWa6 (Alluvium) and GWc3 (Coal Measure).</li> </ul>	<ul style="list-style-type: none"> <li>Monthly.</li> </ul>
	<ul style="list-style-type: none"> <li>Wollar Creek – GWc4 (Coal Measures).</li> <li>Wollar Village – GWa8 (Alluvium) and GWc5 (Coal Measures).</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly.</li> </ul>
<ul style="list-style-type: none"> <li>Water level, field pH and EC, Na, K, Mg, Ca, Cl, HCO<sub>3</sub>, SO<sub>4</sub>, and Total Fe.</li> </ul>	<ul style="list-style-type: none"> <li>Landholder bores, wells and waterholes.</li> </ul>	<ul style="list-style-type: none"> <li>In consultation with individual landholders.</li> </ul>

<sup>1</sup> Monitoring locations are shown on Figure 5.

**Performance Outcomes**

There were no requests for monitoring to be undertaken at any landholder bores, wells or waterholes during the reporting period.

A summary of the groundwater monitoring data recorded during the reporting period is provided in Table 23. A complete set of the groundwater monitoring results for the reporting period is provided in Appendix D. Monthly EC, pH and water levels monitored for the alluvial and coal measure aquifer monitoring bores for the installed water supply bores are also provided in Appendix D.

**Table 23  
Summary of Groundwater Monitoring Data**

Site	Water Level (mbgl)	pH	EC (µS/cm)	Na (mg/L)	K (mg/L)	Mg (mg/L)	Ca (mg/L)	Cl (mg/L)	HCO <sub>3</sub> (mg/L)	SO <sub>4</sub> (mg/L)	Total Fe (mg/L)
GWa1	2.02-3.33	6.9-7.5	5110-8480	1360-1485	19-26	138-174	117-134	1540-1740	1400-1440	304-400	2.3-33
GWa2	0.48-1.23	6.5-7.5	810-1830	105-122	6.3-7	58	52-61	152-209	325-355	26-32	1.9-2.1
GWa3	2.73-3.34	6.4-7.0	1350-2050	232-269	12-18	67-69	72-79	284-255	495-500	161-198	7.6-20
GWa4	1.19-1.71	6.4-7.3	790-2470	157-239	7.4-22	74-97	92-145	266-404	410-475	111-290	3.7-21
GWa5	0.41-0.71	6.2-7.3	4490-9540	1040-1230	28-43	414-462	541-572	1330-1670	405-475	2680-3120	0.3-3.9
GWa6	0.14-0.75	7.0-7.9	1810-8430	490-1050	17-23	65-198	55-160	284-939	575-705	380-1630	2.7-6.5
GWa7	3.19-3.83	6.6-8.9	4950-10110	1330	34	443	387	1790	920	2290	4.1
GWa8	0.93-1.08	6.7-7.3	1950-2150	167-178	10-14	94-108	104-106	255-291	205-235	488-507	0.13-3.1
GWa10	*	6.6-7.2	3720-4290	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWa11	*	7.1-7.4	2470-7100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWa12	*	7.2-7.6	930-2500	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWa14	*	6.7-7.2	1270-3200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWa15	*	6.5-7.5	1190-3080	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWc1	3.74-5.76	6.3-7.6	1030-2180	260-290	10-15	23-33	18-25	376-404	155-182	81-88	1.4-7.1
GWc2	0	6.7-7.3	1010-1190	156-168	20-27	18	45	96-106	470	<2	0.47-2.3
GWc3	0.18-1.38	6.5-7.7	3520-3770	573-604	34-40	107-108	116-119	539-581	640-660	467-522	0.23-1.2
GWc4	11.11-12.36	6.4-7.2	2190-2500	186-217	70-84	74-75	165-166	312-326	670-690	224-264	0.37-2.1
GWc5	3.23-4.40	6.3-6.7	4980-5460	839-867	78-79	154-164	253-275	496-510	2250-2300	385-429	0.69-0.77
GWc10	*	6.8-7.6	1930-3150	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWc11	*	6.2-7.6	2020-5710	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWc12	*	7.0-7.4	2280-2880	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWc14	*	7.1-7.3	1640-1990	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GWc15	*	6.5-7.2	3100-3340	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: ALS (2011)

Notes:

N/A Monitoring of these parameters not required.

\* Refer to Table D-4, Appendix D for water levels.

Carbonate recorded as CaCO<sub>3</sub>

µS/cm = microsiemens per centimetre

mbgl = metres below ground level

Groundwater impact assessment triggers are included in the Groundwater Management Plan (GMP). Monitoring results from bores in the alluvium (i.e. GWa1 to GWa15) during the reporting period indicate an exceedance of the relevant groundwater impact assessment criteria for EC (4,100 µS/cm) at GWa1 (8,480 µS/cm), GWa5 (9,540 µS/cm), GWa6 (8,430 µS/cm) and GWa7 (10,110 µS/cm). Following these exceedances, the groundwater impact investigation protocol was implemented.

Investigations involved consideration of previous monitoring results in conjunction with prevailing and preceding meteorological conditions. The investigations concluded the following:

- High EC values had been recorded for these locations in 2006; the EIS noted that a *highly saline groundwater seep (EC of 11,000 to 12,000  $\mu\text{S}/\text{cm}$ ) enters Cumbo Creek immediately east of Wilpinjong Road (GWA5)*; consistent with baseline and recent monitoring data suggest this is a naturally saline system.
- High EC values were also recorded during the 2007 reporting period for GWA5 and GWA6. During the 2008 reporting period high EC values were recorded at GWA1, GWA5, GWA6, GWA7 and GWA15. During the 2009 reporting period the EC values recorded at GWA1, GWA5, GWA6, and GWA7 were high. During the 2010 reporting period high EC values were recorded at GWA1, GWA5, GWA6 and GWA7.

Monitoring results from bores in both the alluvium and coal seams were generally within the relevant groundwater impact assessment criteria for pH ( $\sim 0.5$  above or below the baseline range).

A review of the SGWRP (Section 3.7.4) has been completed, including the groundwater impact assessment triggers in consideration of the above monitoring results for GWA1, GWA5, GWA6, GWA7 and GWA15. The reviewed plan is currently awaiting assessment from DoPI.

A total of 584 ML was extracted from the Main Pit sump for the reporting period. A breakdown of water extraction volumes is provided in Appendix D. The groundwater extraction limits (as specified in the relevant water licence conditions [Section 1.2.1]) were not applicable, given that no water was extracted from the water supply bores during the reporting period. The bores were reviewed during the reporting period and assessed as being required. This was part of the revision of the SWB (Section 3.7.4).

Recorded groundwater levels are also provided in Appendix D. Recorded groundwater levels for the water supply bores did not drawdown below the reporting or cease-to-pump trigger levels as specified in the SGWRP during the reporting period.

WCPL has partial agreement with NOW for an Open Cut Dewatering Bore Licence for Pit 5, following submission of the MOP variation in the 2009 reporting period (Section 1.2.1).

### **3.6.3 Reportable Incidents**

No environmental incidents or complaints were reported relating to groundwater management at the Mine during the reporting period.

### **3.6.4 Further Improvements**

In response to the Audit recommendations, the SWMP (including the SGWRP and GMP) has been reviewed during this reporting period. The SWMP has also been reviewed and updated in this reporting period and awaiting approval from DoPI.

### 3.7 BLASTING

#### 3.7.1 Environmental Management

##### *Effectiveness of the Control Strategies*

Blast management and mitigation measures were undertaken in accordance with the BMP (approved by the Director-General of the DoPI in May 2006).

In accordance with the MOP and the BMP, the control strategies implemented were considered adequate to manage blast related risks associated with operations during the reporting period. This is demonstrated by the environmental performance measures, as discussed in Section 3.5.2.

Condition 13, Schedule 3 of the Project Approval includes the following operating conditions:

*During mining operations, the Proponent shall:*

- (a) *implement best blasting practice to:*
  - *protect the safety of people and livestock in the area surrounding blasting operations;*
  - *protect public or private infrastructure/property and Aboriginal cultural heritage sites in the area surrounding blasting operations from blasting damage; and*
  - *minimise the dust and fume emissions from blasting at the project;*
- (b) *limit temporary blasting related road closures to 1 per day;*
- (c) *Co-ordinate timing of blasting on site with the timing of blasting at the adjoining Moolarben and Ulan coal mines to minimise the potential cumulative blasting impacts of the three mines; and*
- (d) *Operate a suitable system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Director-General.*

#### 3.7.2 Environmental Performance

##### **Monitoring**

In accordance with Condition 13, Schedule 3 of the Project Approval, a Blasting Hotline continued to operate during the reporting period.

Table 24 outlines the blasting parameters, monitoring locations and frequency of monitoring recorded for the Mine in accordance with the BMP. Blast monitoring locations are shown on Figure 2.

**Table 24  
Summary of the Blasting and Vibration Monitoring Programme**

<b>Monitoring Parameter</b>	<b>Monitoring Sites<sup>1</sup></b>	<b>Frequency</b>
<ul style="list-style-type: none"> <li>• Ground vibration.</li> </ul>	<ul style="list-style-type: none"> <li>• V1, V2 and V3 (Aboriginal rock art sites).</li> </ul>	<ul style="list-style-type: none"> <li>• Every blast within 1 km of sites.</li> </ul>
	<ul style="list-style-type: none"> <li>• Power poles.</li> <li>• Railway culverts.</li> <li>• Railway bridge.</li> </ul>	<ul style="list-style-type: none"> <li>• Every blast within 350 m of sites.</li> </ul>
<ul style="list-style-type: none"> <li>• Ground vibration and airblast overpressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Private residences.</li> </ul>	<ul style="list-style-type: none"> <li>• All blasts within 3 km of residences.</li> </ul>

<sup>1</sup> Monitoring locations are shown on Figure 2.

**Performance Outcomes**

Condition 8, Schedule 3 of the Project Approval and Condition L6.3 and L6.4 of EPL 12425 stipulate ground vibration impact assessment criteria, which is provided in Table 25.

**Table 25  
Ground Vibration Impact Assessment Criteria**

Peak Particle Velocity (mm/s)	Allowable Exceedance <sup>1</sup>
5	5% of the total number of blasts over a period of 12 months
10	0%

<sup>1</sup> Project Approval – Ground vibration levels from blasting at the Mine can not exceed the criteria at any residence on privately owned land.

EPL - The ground vibration peak particle velocity level from blasting operations in or on the premises can not exceed the criteria at any point within the grounds of noise and vibration sensitive locations and within 30 m of any residence or other noise sensitive location such as a school or hospital.

mm/s = millimetres per second

Condition 8, Schedule 3 of the Project Approval and Condition L6.1 and L6.2 of EPL 12425 also stipulate airblast overpressure impact assessment criteria, which is provided in Table 26.

**Table 26  
Airblast Overpressure Impact Assessment Criteria**

Airblast Overpressure Level (dB[Lin Peak])	Allowable Exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

<sup>1</sup> Project Approval - Airblast overpressure level from blasting at the Mine can not exceed the criteria at any residence on privately owned land.

EPL - The airblast overpressure level from blasting operations in or on the premises can not exceed the criteria at any point within the grounds of noise and vibration sensitive locations and within 30 m of any residence or other noise sensitive location such as a school or hospital.

dB (Lin Peak) = decibel linear in peak

The BMP also specifies blast vibration criteria for the following locations:

- Gulgong – Sandy Hollow Railway Line – 100% compliance with a vibration peak particle velocity of 200 mm/s; and
- Culverts - 100% compliance with a vibration peak particle velocity of 80 mm/s.

During the reporting period, blast monitoring was undertaken at the locations listed below (Figure 7):

- Aboriginal rock art site (72) V1;
- Pit 1 main rail east culvert (R1);
- Pit 1 main rail west embankment (R2);
- concrete power pole and concrete railway antenna (R3);
- Pit 2 main rail east, main rail west and main rail culvert (R4); and
- rail loop (R5).

A summary of the blast monitoring results is provided in Table 27. Appendix E provides a complete set of blast monitoring results.

**Table 27  
Summary of Blast Monitoring Results**

	Rock Art (Site 72)		Pit 2 Main Rail Culvert	Pit 2 Main Rail East	Pit 2 Main Rail West	Pit 1 Main Rail East Culvert	Pit 1 Main Rail West Embankment
	V1		R4			R1	R2
	Vibration (mm/s)	Overpressure (dB)	Vibration (mm/s)	Vibration (mm/s)	Vibration (mm/s)	Vibration (mm/s)	Vibration (mm/s)
Maximum	3.76	128.47	N/A	N/A	N/A	N/A	N/A
Minimum	0.36	108	N/A	N/A	N/A	N/A	N/A
Average	1.73	119.58	N/A	N/A	N/A	N/A	N/A
	Concrete Power Pole	Concrete Railway Antenna	Wilpinjong Rail Loop		Nearest privately owned residence - compliance monitoring		
	R3		R5				
	Vibration (mm/s)	Vibration (mm/s)	Vibration (mm/s)	Overpressure (dB)	Vibration (mm/s)	Overpressure (dB)	
Maximum	N/A	N/A	7.84	131.4	0.7	124.64	
Minimum	N/A	N/A	0.05	76.8	0.05	14	
Average	N/A	N/A	0.84	106.48	0.16	88.69	

\* Not detected, vibration below threshold of 0.1 mm/s.

# Not detected, overpressure below threshold of 100 dB

One exceedance of the airblast overpressure impact assessment criteria was recorded during the reporting period. The exceedance occurred on the 16/08/2011. This was reported to OEH. No exceedances of the ground vibration assessment criteria were recorded during the reporting period.

### 3.7.3 Reportable Incidents

One environmental incident was reported relating to blasting at the Mine during the reporting period. Complaints regarding blasting noise received during the reporting period were responded to in accordance with the Mine Complaint Response Protocol (Section 4.1).

### 3.7.4 Further Improvements

In response to the Audit recommendations, the BMP was reviewed and during the reporting period. The BMP is now being assessed by DoPI. WCPL is committed to implementing best practice blast management practices and monitoring programmes in accordance with Condition 13, Schedule 3 and Appendix 8 of the Project Approval.

### 3.8 NOISE

#### 3.8.1 Environmental Management

##### *Effectiveness of the Control Strategies*

Noise management and mitigation measures were undertaken in accordance with the NMP (approved by the Director-General of the DoPI in September 2011). As outlined in the NMP, the Standard Protocol continued to be implemented to facilitate the day-to-day management of noise emissions from Mine activities.

As specified in the MOP and NMP, control strategies were implemented during the reporting period to minimise noise emissions from construction and operation of the Mine. For example, fixed plant and mobile equipment were maintained to remain below the specified maximum operating equivalent continuous noise level ( $L_{Aeq}$ ) sound power levels.

Investigations were undertaken during previous reporting periods in regard to the potential for further noise attenuation at the Mine site. It was concluded however, that no further feasible or reasonable measures were currently available and efforts were therefore focused on managing noise impacts through operational modifications and refinement of monitoring and management procedures.

The effectiveness of the control strategies implemented during the reporting period is demonstrated by the environmental performance measures discussed below.

#### 3.8.2 Environmental Performance

##### *Monitoring*

Table 28 outlines the noise monitoring parameters, locations and frequency recorded for the Mine in accordance with the NMP. Noise monitoring locations are shown on Figure 7.

**Table 28**  
**Summary of the Noise Monitoring Programme**

<b>Monitoring Parameter</b>	<b>Monitoring Sites<sup>1</sup></b>	<b>Frequency</b>
<ul style="list-style-type: none"> <li>Attended noise monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>N4, N6, N7, N9 and N12.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly for the first 12 months of the Mine then complaint-based thereafter.</li> </ul>
<ul style="list-style-type: none"> <li>Real time monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Sentinex 30 ("Williams" 142), Sentinex 31 ("Maher" 58) and Sentinex 33 ("Wollar Central").</li> </ul>	<ul style="list-style-type: none"> <li>Continuous.</li> </ul>

<sup>1</sup> Monitoring locations are shown on Figure 7.

The real time continuous noise monitor Sentinex 33 has since been re-located from the Harkin (49) (now mined owned) residence to a mine owned property in the village of Wollar ("Wollar Central") in response to ongoing consultation (regarding noise) with residences to the east of the Mine.



**Performance Outcomes**

Condition 2, Schedule 3 of the Project Approval stipulates the noise impact assessment criteria and is provided in Table 29.

**Table 29  
Noise Impact Assessment Criteria (dBA)**

Day	Evening	Night		Land Number
		L <sub>Aeq</sub> (15 minute)	L <sub>A1</sub> (1 minute)	
35	39	39	45	58 – Maher
				52A – Long
				52B – Long
				53 – Reynolds
35	39	37	45	23B – Bishop
35	39	36	45	25 – Pettit
35	37	37	45	31A – Conradt
35	36	36	45	31B – Conradt
35	37	37	45	100 – Rheinberger
				125 – Roberts
36	35	35	45	Wollar Village – Residential
35	35	35	45	All other privately owned land
	35 (internal) 45 (external) When in use		-	901 – Wollar School
	40 (internal) When in use		-	150A – St Luke’s Anglican Church 900 – St Laurence O’Toole Catholic Church
	50 When in use		-	Goulburn River National Park/Munghorn Gap Nature Reserve

Notes:

- (a) Noise from the Mine is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 m of a dwelling (rural situations) where the dwelling is more than 30 m from the boundary, to determine compliance with the L<sub>Aeq</sub>(15 minute) noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the Mine is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- (b) Noise from the Mine is to be measured at 1 m from the dwelling façade to determine compliance with the L<sub>A1</sub>(1 minute) noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the Mine is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- (c) For the Goulburn River National Park/Munghorn Nature Reserve noise levels are to be assessed at the most affected point within 50 m of the Goulburn River National Park/Munghorn Nature Reserve. The limit applies when the area is in use.
- (d) The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 m above ground level; or
  - temperature inversion conditions of up to 3°C/100 m, and wind speeds of up to 2 m/s at 10 m above ground level.

\* Refer to Project Approval for complete table.

dBA = A-weighted decibels.

### **Attended Noise Monitoring**

Attended noise monitoring was undertaken on a bi-monthly basis at five locations, including the Langshaw (6) dwelling (N4), St Laurence O'Toole Catholic Church (Wollar – Residential) (N6), Ulan-Wollar Road (East) (N7), Maher dwelling (Slate Gully Road – Wollar) (N9) and Ulan-Wollar Road (west) (Ulan Coal Mines – N12).

Attended monitoring at these locations indicated that the mine “complied with noise consent limits at all monitoring locations” during the reporting period. Appendix F provides the Six-monthly Attended Noise Monitoring Reports.

Noise levels complied with noise limits at all sites during the January to June 2011 attended monitoring, with the exception of N12 in March/April 2011. At N12, the  $L_{Aeq (period)}$  of 38 dB exceeded the relevant criterion by 2 dB on the 27 April 2011 during the night period. Noise sources during this measurement included a continuum, dozer tracks and horns.

This exceedance is not considered significant as Chapter 11 of the OEH 'Industrial Noise Policy' deems a development to be in non-compliance only when “*the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence condition.*”

### **Unattended Noise Monitoring**

Three remote continuous noise monitors were utilised throughout the reporting period. One of the stations (Sentinex31) was located to the east of the Mine at the Maher (58) dwelling near Slate Gully Road. Another of the stations (Sentinex33) was located to the south of the Mine at the Harkin (49) property (mine owned) from September 2010 to May 2011, and then relocated to the east of the mine at a mine owned property in the Wollar Village, “Wollar Central” from May 2011. The third (Sentinex30) was located to the east of the mine at the Williams (142) dwelling (Figure 7).

The location of the Maher (58) noise monitor represents a noise compliance point (i.e. land numbers) as provided in Condition 2, Schedule 3 of the Project Approval.

The continuous noise monitors were installed to continually record noise levels adjacent to the Mine. These monitors do not discriminate between Mine-related noise and other noise sources such as birds, dogs, road traffic, wind, rain, etc. As a result, the noise data is required to be analysed and filtered so that Mine-related noise can be separated and determined from other noise sources.

The continuous noise data is filtered and analysed on a quarterly basis. A summary of the results is provided below. In the revised NMP, real-time noise data has been utilized to develop data exclusion rules for noise investigation triggers, which are designed to exclude extraneous noise sources. The data exclusion rules are contained in the new revised NMP which can be viewed at [www.peabodyenergy.com.au/nsw/wilpinjong-documents.html](http://www.peabodyenergy.com.au/nsw/wilpinjong-documents.html)

#### *$L_{Aeq (15\ minute)}$ Cumulative Noise Level Results*

Monitoring data is compiled as statistical cumulative frequency distribution curves for the required monitoring locations and show cumulative noise levels for the day, evening and night periods and any percentage exceedances relative to the Project Approval criteria. It should be noted that analysis of cumulative distribution data does not identify the sources of noise, only when exceedances of specific noise levels have occurred. However, the assessed exceedance rate based on measures monitoring data that has been filtered for low frequency noise and to exclude data captured during periods of high winds (i.e. > 3 m/s) and rain.

*L<sub>Aeq (period)</sub> Noise Level Results*

L<sub>Aeq(period)</sub> monitoring data is compiled from the L<sub>Aeq(15 minute)</sub> data as an average of noise level for each day, evening and night period and is used to assess the impact of mining operations on the amenity of the receiving noise environment. The L<sub>Aeq (period)</sub> noise descriptor does not, however, represent a Project Approval condition. However, L<sub>Aeq (period)</sub> 40 dBA is an indicative acceptable noise limit for a residence in a rural environment in accordance with the NSW Industrial Noise Policy (EPA, 2000). Monitoring results for the reporting period indicate that night-time cumulative L<sub>Aeq (period)</sub> noise levels were above 40 dBA on a number of occasions as shown in Table 30.

Review of the audio data indicated that meteorological conditions, livestock, barking dogs, and insects were the dominant noise sources at the Williams (142), Maher (58), Harkins (49) and Wollar Central sites for the reporting period. The passages of trains along the Gulgong to Sandy Hollow railway were also identified as the dominant noise source at the Maher (58), Williams (142) and Wollar Central sites during the reporting period.

Review of meteorological monitoring data indicates the observed mining noise levels may have been enhanced by temperature inversion not subject to exclusion in accordance with the methodology used during the reporting period until the inversion tower was commissioned in August 2011. Assessment of atmospheric stability at times, before commissioning of the inversion tower, (using the sigma-theta assessment) suggests the presence of Pasquill-Gifford D to F type atmospheric stability. However, measured temperature lapse rates of up to +0.8C were observed between 2 and 10 metre measurement data, suggesting the presence of inversion conditions that would typically exclude noise impacts at these times.

**Table 30**  
**Night-time L<sub>Aeq (period)</sub> Noise Level Summary**

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Maher</b>	Valid Data (%)	64	45	45	55
	Measured Exceedance (%)	1	4	6	<1
	Assessed Exceedance (%)	0	4	1	0
<b>Williams</b>	Valid Data (%)	58	41	45	53
	Measured Exceedance (%)	6	2	23	5
	Assessed Exceedance (%)	<1	0	0	0
<b>Harkin</b>	Valid Data (%)	63	50 <sup>^</sup>	*	*
	Measured Exceedance (%)	7	4 <sup>^</sup>	*	*
	Assessed Exceedance (%)	4	4 <sup>^</sup>	*	*
<b>Wollar Central</b>	Valid Data (%)	*	36 <sup>^</sup>	45	52
	Measured Exceedance (%)	*	4 <sup>^</sup>	23	9
	Assessed Exceedance (%)	*	0 <sup>^</sup>	<1	2

\* = Not operational in the location

<sup>^</sup> = Only operational for part of quarter

*L<sub>A1</sub> (1 minute) Sleep Disturbance Results*

Peak *L<sub>A1</sub> (1 minute)* noise levels recorded at the Maher (58) dwelling indicated measured exceedances of the 45 dBA night-time criteria on a number of occasions during the reporting period as shown in Table 31. A review of audio data indicated that mining operations were not the dominant noise source during the exceedances of the sleep disturbance criteria during events recorded during the reporting period. Measured exceedances during the period were attributed to multiple sources including insect & animal noise, train activities and gusting winds.

Peak *L<sub>A1</sub> (1 minute)* noise levels recorded at the Williams (142) dwelling indicated measured exceedances of the 45 dBA night-time criteria on a number of occasions during the reporting period as shown in Table 31. A review of audio data attributed the measured exceedances to multiple sources including insects, animal noise, train noise and gusting wind.

Peak *L<sub>A1</sub> (1 minute)* noise levels recorded at the Harkin (49) dwelling indicated measured exceedances of the 45 dBA night-time criteria on a number of occasions during the period January to May as shown in Table 31. A review of audio data attributed the measured exceedances to multiple sources including wind, insects, planes, birds and livestock. A review of audio data indicated that mining operations were not the dominant noise source.

Peak *L<sub>A1</sub> (1 minute)* noise levels recorded at the Wollar Central indicated measured exceedances of the 45 dBA night-time criteria on a number of occasions during the period May to December as shown in Table 31. A review of audio data attributed the measured exceedances to multiple sources including trains, birds and animal noise. A review of audio data indicated that mining operations were not the dominant noise source.

**Table 31**  
**Night-time *L<sub>A1</sub> (1 minute)* Noise Level Summary**

		<i>L<sub>A1</sub> (1 minute)</i>			
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
<b>Maher</b>	Data Valid (%)	83	72	73	75
	Measured Exceedance (%)	36	24	21	44
	Assessed Exceedance (%)	0	0	0	0
<b>Williams</b>	Data Valid (%)	80	72	74	68
	Measured Exceedance (%)	55	37	33	54
	Assessed Exceedance (%)	0	0	0	0
<b>Harkin</b>	Data Valid (%)	91	83 <sup>^</sup>	*	*
	Measured Exceedance (%)	13	11 <sup>^</sup>	*	*
	Assessed Exceedance (%)	0	0 <sup>^</sup>	*	*
<b>Wollar Central</b>	Data Valid (%)	*	79 <sup>^</sup>	71	66
	Measured Exceedance (%)	*	33 <sup>^</sup>	32	54
	Assessed Exceedance (%)	*	0 <sup>^</sup>	0	0

\* = Not operational in the location

<sup>^</sup> = Only operational for part of quarter

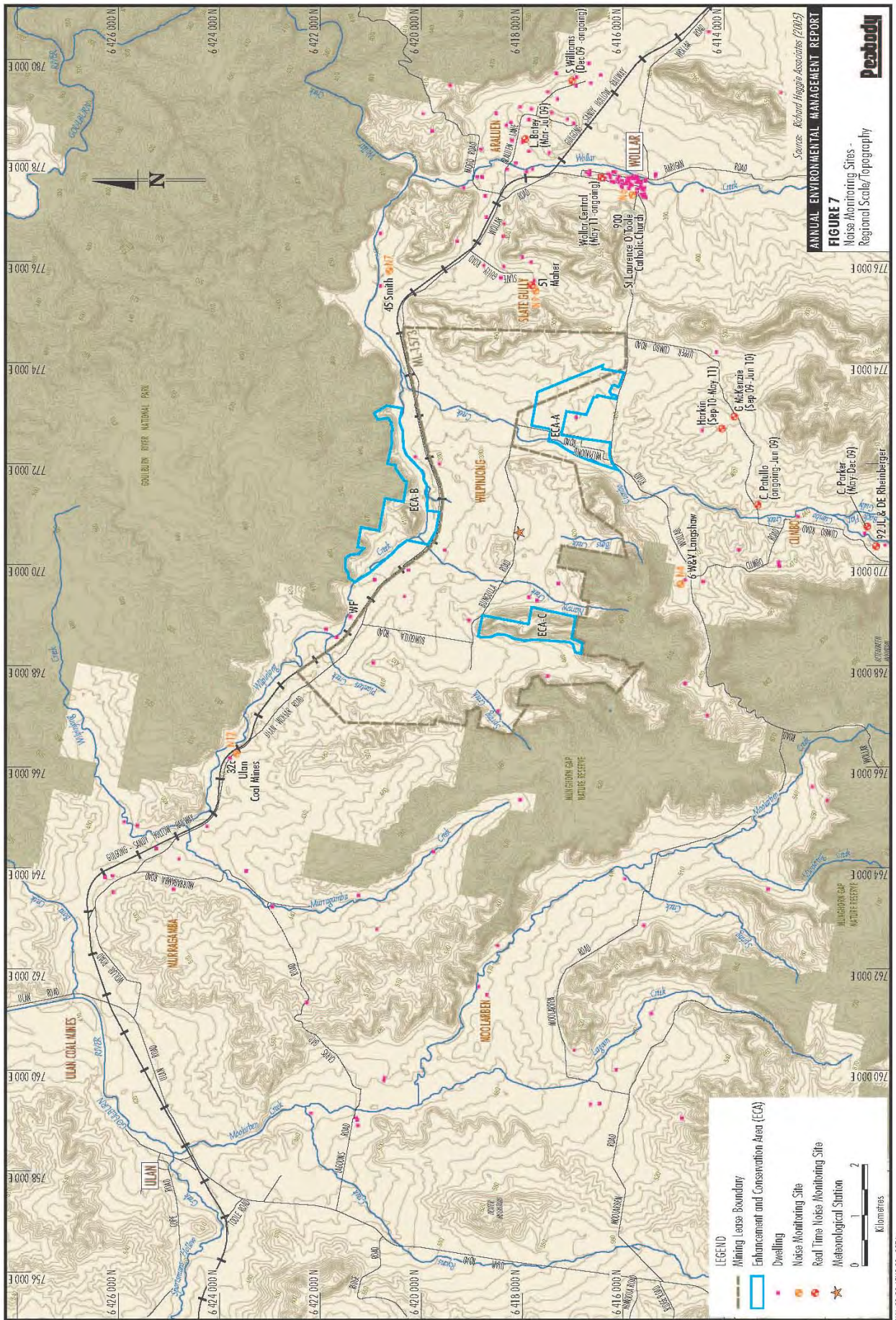
### **3.8.3 Reportable Incidents**

No environmental incidents were reported relating to noise at the Mine during the reporting period. Complaints regarding noise received during the reporting period were responded to in accordance with the Mine Complaint Response Protocol (Section 4.1).

### **3.8.4 Further Improvements**

WCPL continues to engage with residents surrounding the Mine in regard to the communication of noise monitoring results and the investigation of preventative noise measures, noise attenuation and property acquisition (Section 4.1).

A 60 metre tower has been installed and commissioned to measure temperature inversions over a 50 metre difference; this will give more accurate measurements of the compliance condition of temperature lapse rates of 3°C/100m.



### **3.9 ABORIGINAL HERITAGE**

#### **3.9.1 Environmental Management and Performance**

Aboriginal heritage management and mitigation measures were undertaken in accordance with the ACHMP (approved by the Director-General of the DoPI in February 2006). Control measures for managing and monitoring Aboriginal heritage were implemented in accordance with the MOP and ACHMP during the reporting period and were considered to be effective.

In accordance with Conditions 46 to 48, Schedule 3 of the Project Approval, an archaeological salvage programme continued to be implemented during the reporting period. The Aboriginal community was involved in salvage work, in which test excavations have been conducted in the Southern End of Pit 5. A Keeping Place continues to be maintained on-site for the temporary storage of recovered materials prior to their re-placement on rehabilitated landforms and in the ECAs.

In accordance with the ACHMP and Native Title Agreement, the Native Title Implementation Committee and Cultural Heritage Liaison Sub-Committee met on three occasions during the reporting period (Section 4.2).

Monitoring and management of rock art sites occurred throughout the reporting period and included dust deposition and ground vibration monitoring in accordance with the AQMP, BMP and ACHMP (Sections 3.4, 3.8 and 3.10, respectively).

The Native Title Liaison Officer continued to facilitate the Cultural Heritage Employee and Contractor Training Programme and educate site personnel about cultural heritage management at the Mine.

In accordance with the Native Title Agreement, WCPL continued to offer employment and work skills training programmes, including the recruitment of an administrative trainee to assist the Native Title Liaison Officer (annual contract).

One Aboriginal artefact site was disturbed during the reporting period. The disturbance occurred on the 14/12/2011. This was reported to OEH, DoPI and all other related regulatory departments. The area remains closed to access pending further investigation.

Appendix G provides a complete set of salvage sign-off sheets to identify culturally cleared areas during the reporting period.

#### **3.9.2 Reportable Incidents**

One environmental incident was reported relating to disturbance of an Aboriginal artefact site at the Mine during the reporting period.

No complaints were reported regarding Aboriginal heritage during the reporting period.

#### **3.9.3 Further Improvements**

No further improvements to Aboriginal heritage management are proposed for the next reporting period.

### **3.10 NON-ABORIGINAL HERITAGE**

No activities or monitoring relevant to non-Aboriginal heritage occurred during the reporting period.

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### 3.11 SPONTANEOUS COMBUSTION

In accordance with Condition 4 of the MOP, a SCMP was prepared and approved by the DTIRIS on 20 July 2006, prior to coal extraction taking place. In accordance with Condition 22 (c), Schedule 3 of the Project Approval, the SCMP was also prepared to detail the management measures that WCPL and Thiess would incorporate to minimise the off-site odour and fume emissions generated by any spontaneous combustion at the Mine.

Management measures to reduce the risk of or manage spontaneous combustion events were implemented in accordance with the SCMP during the reporting period. Small isolated outbreaks of spontaneous combustion occurred during the reporting period. These were managed by smothering the area with inert overburden material to remove available oxygen, whilst outbreaks in coal stockpiles were processed through the CHPP.

Complaints regarding spontaneous combustion received during the reporting period were responded to in accordance with the Mine Complaint Response Protocol (Section 4.1).

Reporting of spontaneous combustion events has been included in the fortnightly environmental inspections and the daily OCE inspection reports.

There have been five environmental incidents reported as uncontrolled emissions into the atmosphere during the reporting period resulting from Spontaneous Combustion events, as shown in Table 32.

**Table 32  
Spontaneous Combustion Incident Summary**

Date of Incident	Description of Incident
12/08/2011	Spontaneous combustion on a reject dump location.
23/08/2011	Material was being excavated from the eastern end of Pit 5. Some of the material was hot and when exposed to allow access to coal on the floor, was emitting smoke and spontaneous combustion fumes. The material was excavated with Excavator 1627 and loaded into trucks. This was dumped and rolled with a dozer prior to burial.
5/09/2011	No activities were conducted near the location. An outbreak of spontaneous combustion occurred in 4 spots on the north face of Duffy Dump. Smoke fumes were emitted.
20/10/2011	No activity was being conducted. An outbreak of spontaneous combustion occurred on the west dump face above pit 5 north east ramp.
22/11/2011	Excavation of noise bund. An outbreak of spontaneous combustion occurred whilst excavating.



### **3.12 THREATENED SPECIES**

#### **3.12.1 Environmental Management and Performance**

Threatened species management and mitigation measures were undertaken in accordance with the RMP (approved by the DoPI in February 2006).

Control measures for managing and monitoring threatened species were implemented in accordance with the MOP and RMP, and were considered to be effective during the reporting period. These included implementation of a Vegetation Clearance Protocol (VCP) and specific fauna management strategies.

The VCP included delineation of areas to be cleared of remnant vegetation, pre-clearance surveys, management of impacts on fauna, and vegetation clearance procedures. Habitat tree mapping and inspection of felled trees was undertaken in February and November 2011 prior to clearance activities in Pit 2 and Pit 5. A total of 52 habitat trees were felled and inspected during this time. Management strategies were implemented to minimise impacts on fauna during the felling of habitat trees. All felled habitat trees were inspected for evidence of trapped or injured individuals, and any individuals located were either extracted from the hollows and taken into care with a wildlife rescue organisation, or released. No threatened fauna species were recovered from the felled habitat trees and therefore implementation of the Threatened Species Management Protocol (TSMP) was not required.

Other fauna management strategies included the identification and monitoring of wombat burrows, followed by trapping and relocation of individuals prior to vegetation clearance and land disturbance. Appendix H provides the Habitat Tree Register Summary results.

#### ***Offset Strategy***

In accordance with the RMP, fencing maintenance was undertaken to maintain stock exclusion from the Environmental Conservation Areas (ECAs) during the reporting period.

Monitoring of the ECAs was also undertaken in September 2011 as part of an annual monitoring programme which commenced in 2007, designed to assess the degree and rate of rehabilitation in these areas. Monitoring was compared to the baseline data collected in the previous reporting period for a number of long term monitoring transects that have been established across the Mine site. The monitoring results indicated a marked variation in the status of the monitoring sites given the range of disturbance levels that has occurred at individual sites (i.e. from sites with undisturbed vegetation to other sites where pasture generation has been the dominant landuse and there is little or no generation of native species). It is anticipated that changes in the upper storey vegetation and groundcover across these areas will occur quite rapidly given stock exclusion, although damage caused by the invasion of rabbits & marsupials will continue to slow the re-establishment of perennial grasses and the successful rehabilitation of the ground layer.

#### **3.12.2 Reportable Incidents**

No environmental incidents or complaints were reported regarding threatened species management during the reporting period.

#### **3.12.3 Further Improvements**

WCPL with assistance from the NSW Wildlife Information, Rescue and Education Service (WIREs), are looking into a suitable location and costing to provide an area for a pre-release enclosure for rehabilitated native animals.

### **3.13 WEEDS AND ANIMAL PESTS**

#### **3.13.1 Environmental Management and Performance**

Weed and animal pest management and mitigation measures were undertaken in accordance with the MOP and RMP during the reporting period.

##### ***Weed Control***

Ongoing monitoring and control of weeds on WCPL-owned land was undertaken as part of general land management practices, and included:

- ongoing surveys of WCPL-owned lands to identify areas requiring follow-up herbicide treatment or any new areas requiring treatment;
- follow-up herbicide treatment of noxious weeds such as Blackberry in ECAs; and
- limiting the potential for the establishment of new weeds on ECAs by minimising the transport of weed species to and from ECAs (e.g. limiting vehicle access and minimising stock access through fencing).

During the reporting period St John's Wart was found to be very vigorous and subsequently required much more spraying that has been traditionally necessary to control its propagation. Additionally good progress was made controlling of Tree-of-Heaven and Blackberry.

##### ***Feral Animal Control***

Feral animal control strategies undertaken included the use of poison baits to control populations of rabbits and foxes.

WCPL also provided financial assistance to the Wild Dog Destruction Board, whose role is to initiate actions aimed at the eradication of dingoes and wild dogs. Operational procedures included the maintenance of a clean rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna such as rodents and birds. Lids on waste and recyclables skips were also kept closed to prevent scattering of materials by vermin.

The above control strategies were considered adequate to manage weed and animal pest related risks associated with operations during the reporting period.

#### **3.13.2 Reportable Incidents**

No environmental incidents or complaints were reported relating to weed and animal pest control at the Mine during the reporting period.

#### **3.13.3 Further Improvements**

Improvements to weed and animal pest management measures between ECA-C and the Munghorn Nature Reserve are proposed for the next reporting period. Feral animal control, particularly rabbits and foxes, will continue to be a priority given their effect on native species re-generation within the ECAs (Section 3.13.1).

### **3.14 ROAD TRANSPORT**

#### **3.14.1 Environmental Management and Performance**

In accordance with the Statement of Commitments (Appendix 8) of the Project Approval, a number of improvements to the road network were commenced and/or completed during the reporting period, including:

- Maintenance of the Ulan-Wollar Road between the Murragamba Creek and the Mine access road.

WCPL also encourages staff car pooling by offering financial incentives to Mine employees who engage in the car pooling programme. WCPL has also set advised speed limits of 80 kilometres per hour (km/h) on the Ulan-Wollar Road for all employees to help minimise local traffic impacts (the actual speed limit for this road is 100 km/h).

#### **3.14.2 Reportable Incidents**

No environmental incidents were reported relating to road transport at the Mine during the reporting period. One Environmental complaint was received by WCPL regarding the passage of B- double trucks on the Ulan – Wollar road. An investigation was undertaken and the truck in question conforms to the allowable standard of an A-double truck. WCPL is planning to install an additional diesel fuel tank onsite in the next reporting period. This will reduce the number of truck movements and the frequency the fuel truck will travel on the Ulan – Wollar Road.

#### **3.14.3 Further Improvements**

WCPL continued to make road maintenance contributions to the MWRC in accordance with Condition 3, Appendix 2 of the Project Approval. WCPL will continue to engage in consultation with Ulan Mines and Moolarben Mines in regard to reaching agreement on shift timing arrangements.

COMMUNITY RELATIONS

3.15 ENVIRONMENTAL COMPLAINTS

A total of 58 environmental-related complaints were received by WCPL during the reporting period compared with the 138 received during the previous AEMR reporting period (figure 8). The majority of complaints were related to noise, spontaneous combustion and blasting related complaints also received. The majority of complaints were received from the areas of Araluen Lane/Road, and Wollar (figure 9).

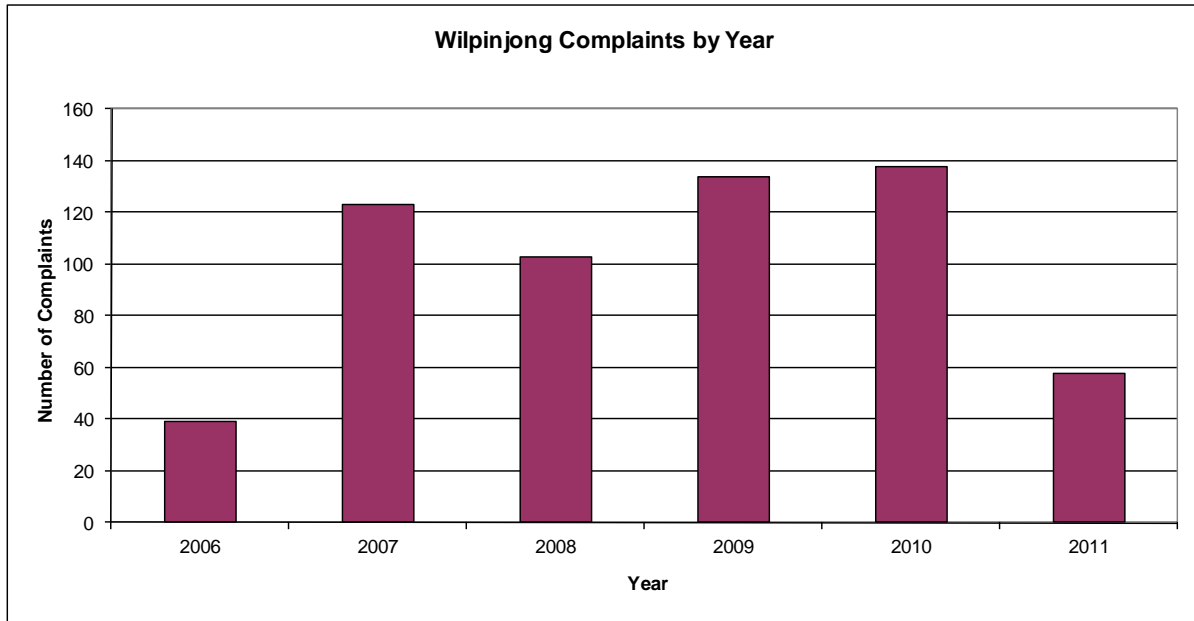


Figure 8 Environmental Complaints by Year of Operation

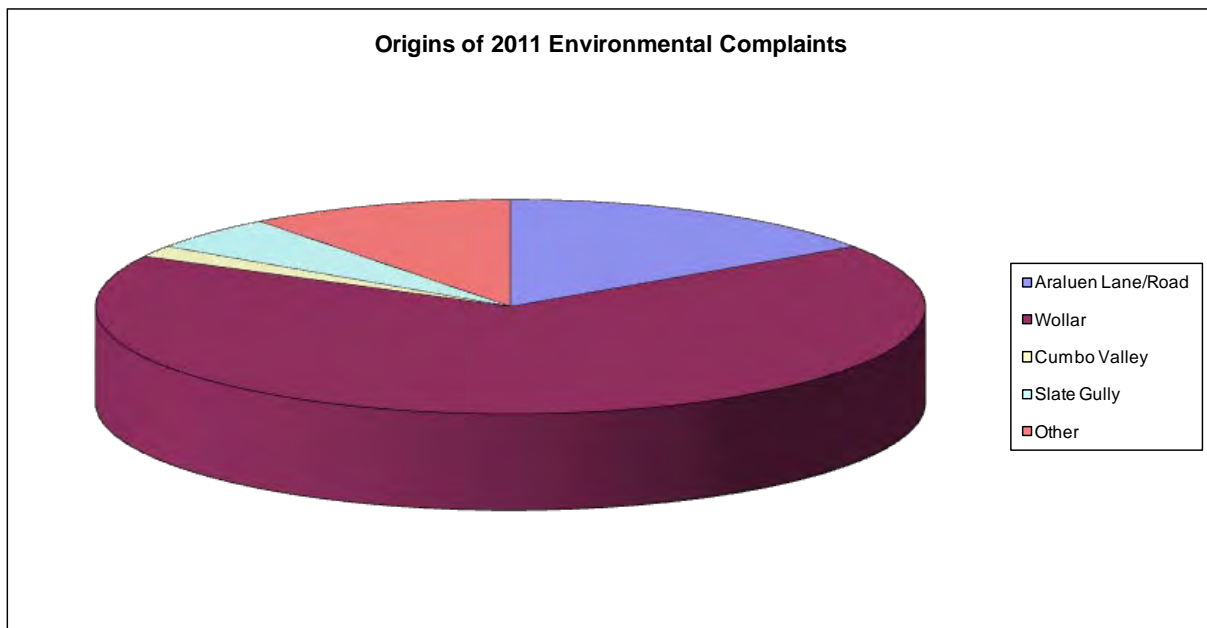


Figure 9 Origins of Environmental Complaints

Mine-related complaints are managed in accordance with the Mine Complaints Response Protocol as outlined in the Mine EMS.

A summary of the complaints register is provided in Appendix I.

### 3.16 COMMUNITY LIAISON

In accordance with Condition 10, Schedule 5 of the Project Approval, the CCC continued to meet during the reporting period. The Native Title Implementation Committee and the Cultural Heritage Liaison Sub-Committee also met during the reporting period. The chronology of community consultation meetings held during the reporting period is outlined in Table 33.

**Table 33  
Community Consultation Committee Meeting Summary**

Date	Meeting Type
7 February 2011	Cultural Heritage Liaison Sub Committee; and Native Title Implementation Committee and North Eastern Wiradjuri Wilpinjong Community Fund
7 March 2011	CCC – Community Consultative Committee Meeting
14 March 2011	Native Title Implementation Committee and North Eastern Wiradjuri Wilpinjong Community Fund
6 June 2011	CCC – Community Consultative Committee Meeting
14 June 2011	Cultural Heritage Liaison Sub Committee; and Native Title Implementation Committee and North Eastern Wiradjuri Wilpinjong Community Fund
5 September 2011	CCC – Community Consultative Committee Meeting
20 September 2011	Native Title Implementation Committee and North Eastern Wiradjuri Wilpinjong Community Fund
29 November 2011	Cultural Heritage Liaison Sub Committee; and Native Title Implementation Committee and North Eastern Wiradjuri Wilpinjong Community Fund
7 November 2011	CCC – Community Consultative Committee Meeting

As discussed in Section 3.10.1, WCPL was acknowledged for its community cultural heritage achievements by credited recognized as a finalist in the Indigenous Category of the 2009 Banksia Environmental Foundation Awards.

## **4 REHABILITATION**

### **4.1 BUILDINGS**

No buildings were removed during the reporting period.

### **4.2 REHABILITATION OF DISTURBED LAND**

Sixty five hectares of spoil was rehabilitated in 2011 in the northern end of Pit 1.

Rehabilitation activities included:

- re-shaping of mine spoil
- capping with 2 metres of inert material
- topsoil placement; and
- contour ripping, seeding and fertilising.

Mine spoil is progressively reshaped behind active mining to construct a landform generally consistent with the final landform surface. The final landform design is a continually evolving design which changes in response to changes in mine planning. Initial reshaping is undertaken to minus two metres below final landform surface and then two metres of inert overburden is placed on top of the initially reshaped surface to bring the final surface up to the design RL. Dozers involved in the reshaping are fitted with APS GPS technology to allow operators to reshape to the design surface. The final landform design surface is designed to drain from south to north which is consistent with the pre mining landform surface.

Drainage works are constructed to the specifications set out in the draft Rehabilitation Management Plan that has been submitted to the Department of Planning following the Wilpinjong Independent Environmental Audit in 2008. The drainage works constructed as part of the 2011 rehabilitation included a series of contour banks which assist with directing water from the top of slopes down to the base of the landform. All water draining from the rehabilitated landforms is initially captured on site and recycled. However, water from rehabilitated areas will be allowed to drain from site once the landforms have been sufficiently revegetated. This will take between 2 – 5 years depending on revegetation establishment.

Rehabilitation activities were hampered in 2011 by wet weather. The original target of 110Ha was not achieved by end of December 2011 due to these issues. However, this target was revised down due to the construction of haul roads and a proposed new remote crib hut area in Pit 5. Work will now progress on the 2012 rehabilitation which is shown on Plan 3 at the rear of this document. It is planned to rehabilitate 41Ha of mine spoil in 2012.

A variety of locally occurring eucalypt and acacia species were seeded into the 2011 rehabilitation areas along with exotic and native pasture grasses. Germination has been good due to ongoing rainfall.

Vegetation monitoring points were established in the 2008 rehabilitation during the 2009 ECA vegetation monitoring program. Further rehabilitation monitoring points were established in the 2009 rehabilitation and 2010 rehabilitation area. All vegetation monitoring sites will be monitored annually and data and information collected from this monitoring work will be compared against success criteria to gauge the progress of the rehabilitation

The cumulative area of rehabilitation is set out below in Table 34.

**Table 34.  
Cumulative Rehabilitation Areas**

<b>Year Rehabilitated</b>	<b>Area (Ha)</b>	<b>Final Land Use</b>	<b>Cumulative Area (Ha)</b>	<b>Success Criteria</b>
2008	10	Native Ecosystem	10	As per RMP
2009	25	Native Ecosystem	35	As per RMP
2010	65	Native Ecosystem	100	As per RMP
2011	65	Native Ecosystem	165	As per RMP
2012	41	Native Ecosystem		As per RMP

#### **4.3 OTHER INFRASTRUCTURE**

No other infrastructure (e.g. fences, exploration pads or associated infrastructure) was rehabilitated during the reporting period.

#### **4.4 REHABILITATION TRIALS AND RESEARCH**

No trials were undertaken during the reporting period.

#### **4.5 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN**

A review of the final landform design was completed during the reporting period, which includes a tailings management strategy. The design was based on current mine planning and will continue to be revised if necessary following future mine planning modifications. A detailed mining schedule has also been completed based on the current life-of-mine plan.

Rehabilitation Monitoring Report is shown in Appendix J.

## **5 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD**

A number of activities are proposed to be undertaken in the next AEMR period in accordance with the Project Approval and environmental management and monitoring programmes, including:

- implementation of the activities proposed in the response to the Audit report (Section 3);
- continuation of rehabilitation works in mined areas, primarily in Pit 1, Pit 2 and Pit 5 (refer to Plan 3);
- A review of rehabilitation areas to assess maintenance requirements;
- continued weed and animal pest control across the WCPL owned land;
- continued stock exclusion in ECAs to promote regeneration and weed reduction;
- continued consultation with surrounding landholders; and
- final commissioning of the CHPP expansion.



## PLANS

## **PLANS**

In accordance with Section 4 of the Guidelines, a number of plans (including a proposed land preparation plan, proposed mining activities plan and proposed rehabilitation plan) are required to be prepared for the Annual Environmental Management Report. These plans are to show equivalent information to plans provided in the current Mining Operations Plan (MOP) (February 2007 to January 2012).

### ***Proposed Land Preparation Plan***

Plan 1 shows proposed land preparation areas (including topsoil stockpiles, out-of-pit dumps and disturbance areas) for the next reporting period.

### ***Proposed Mining Activities Plan***

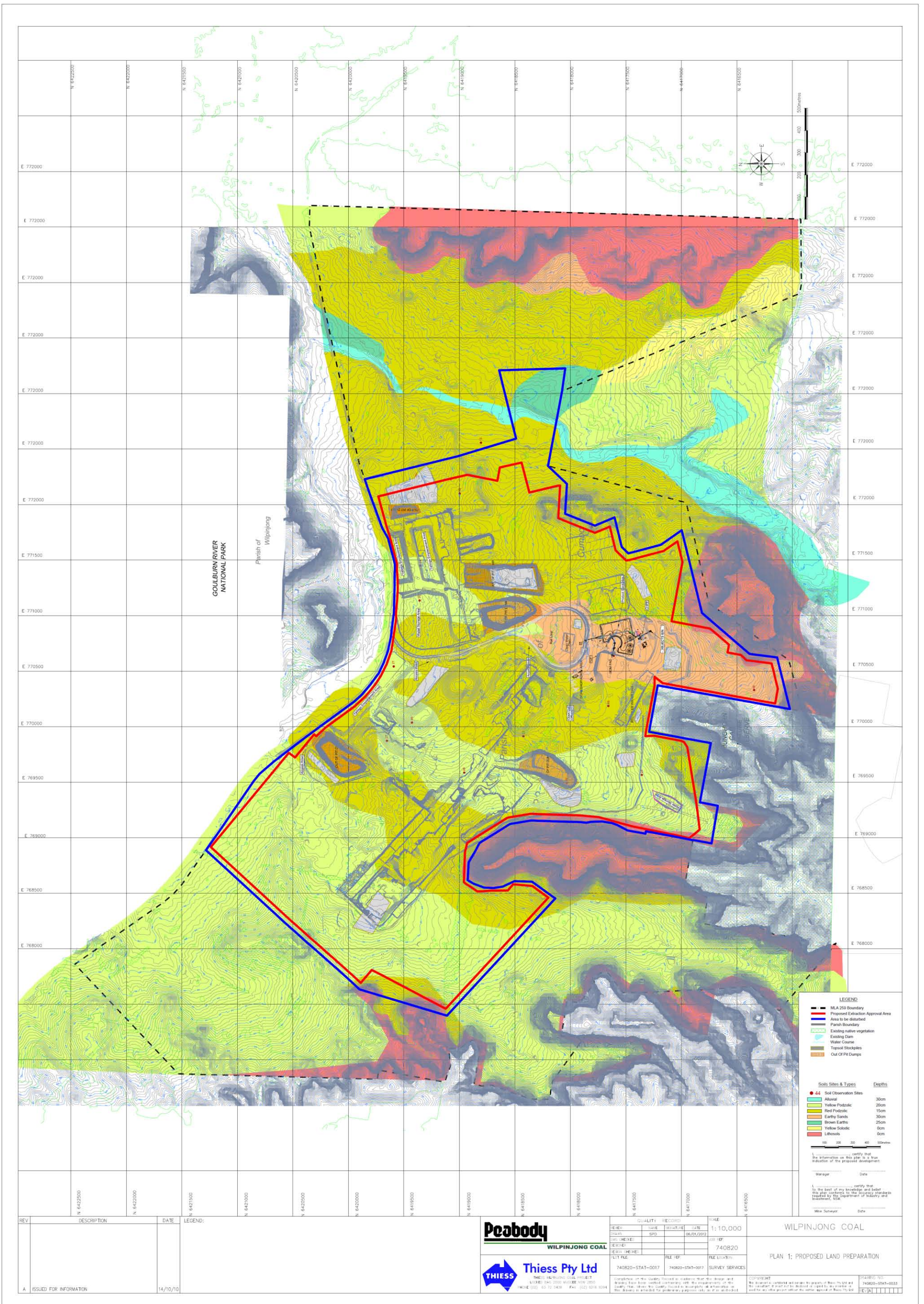
Plan 2 shows proposed mining operations including the layout of the open cut pits, topsoil stockpiles water management structures, tailings emplacement and infrastructure areas and out-of-pit dumps.

Mining activities for the next reporting period have been addressed in the MOP. A summary of operations for the next reporting period is provided in Section 6 of this report.

### ***Proposed Rehabilitation Plan***

Rehabilitation activities proposed for the next reporting period are described in the MOP and shown on Plan 3.

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**LEGEND**

- MLA 250 Boundary
- Proposed Extraction Approval Area
- Area to be disturbed
- Parish Boundary
- Existing native vegetation
- Existing Dam
- Water Course
- Topsoil Stockpiles
- Out Of Pit Dumps

**Soils Sites & Types**

Soil Observation Sites	Depths
Abnormal	15cm
Yellow Podzolic	25cm
Red Podzolic	30cm
Earthy Sands	25cm
Brown Earths	25cm
Yellow Solonch	0cm
Lithocolls	0cm

Scale: 1:10,000  
 Date: 08/29/2017  
 File: 740820-STAT-0017  
 Survey Services: 740820-STAT-0017

REV	DESCRIPTION	DATE
A	ISSUED FOR INFORMATION	14/10/10

**Peabody**  
 WILPINJONG COAL

**Thiess Pty Ltd**  
 THIESS WILPINJONG COAL PROJECT  
 LURIE ROAD WILPINJONG NSW 2855  
 PHONE 08 93 73 3430 FAX 08 93 73 3034

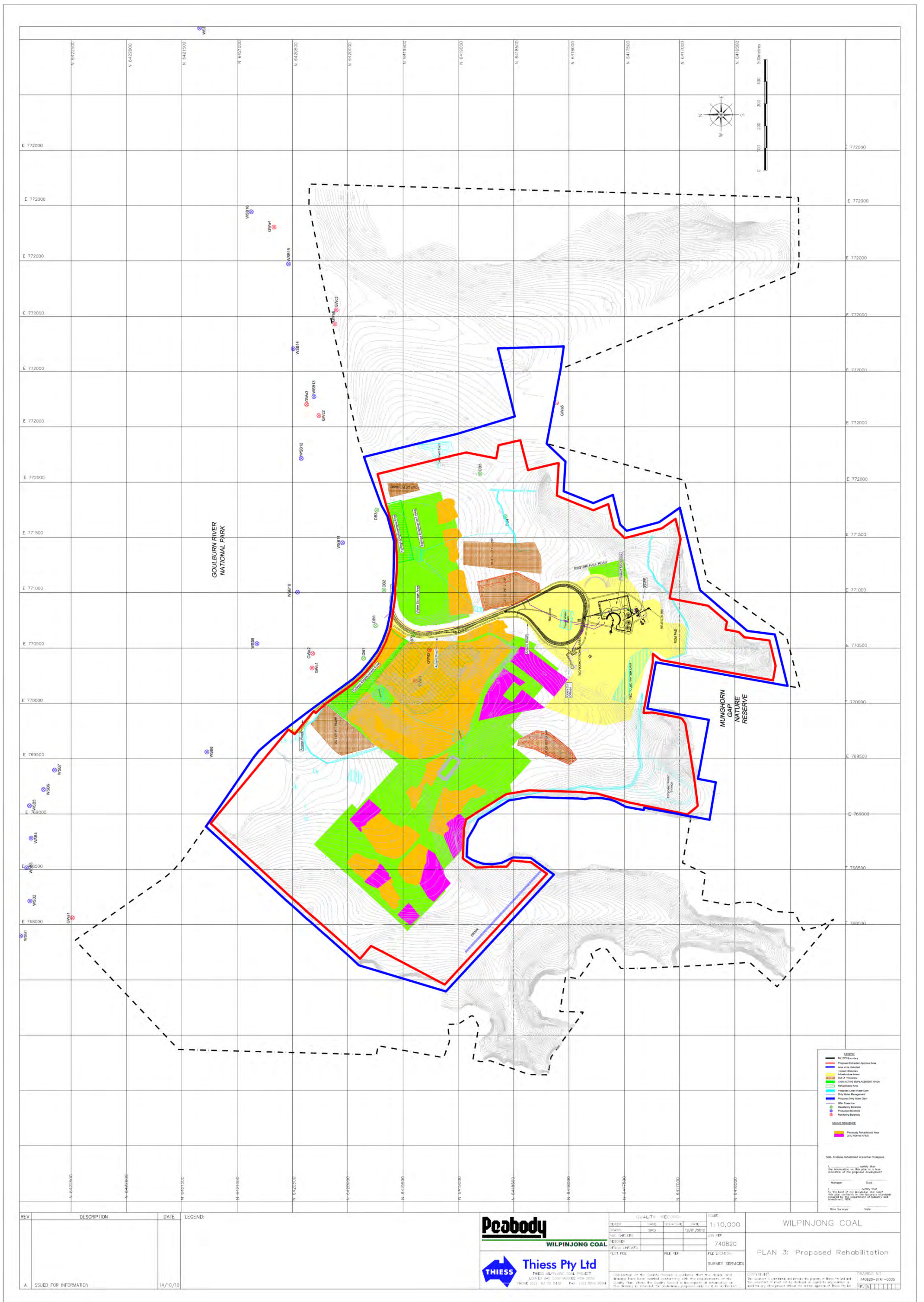
Completion of this quality record certifies that the Manager and Workers have been certified accordingly with the requirements of the Quality Management System. The quality record is a property of Thiess Pty Ltd and will be retained in perpetuity for the purposes of the System as detailed for performance purposes only as an addendum.

MANAGER: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SURVEY SERVICES: \_\_\_\_\_ DATE: \_\_\_\_\_

WILPINJONG COAL  
 PLAN 1: PROPOSED LAND PREPARATION

740820-STAT-0033  
 [Signature]





REV	DESCRIPTION	DATE	LEGEND:
A	ISSUED FOR INFORMATION	14/10/10	

**Peabody**  
WILPINJONG COAL

**Thiess Pty Ltd**

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Phone: (02) 9232 2400 Fax: (02) 9232 2404

QUALITY	REVISION	SCALE
DATE	DATE	1:10,000
740820	12/05/2012	

WILPINJONG COAL  
PLAN 3: Proposed Rehabilitation

340820-STAT-0035

DATE: 14/10/10

BY: [Signature]

DATE: 14/10/10