ANNUAL

REVIEW

DURALIE COAL MINE

TEXT VOLUME

DURALIE COAL PTY LTD

SEPTEMBER 2011

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ANNUAL REVIEW

INTRODUCTION

This Annual Review (AR) covers the environmental protection, pollution control and rehabilitation activities at the Duralie Coal Mine up until 4 September 2011. Where applicable, comparisons of performance have been undertaken against the plans outlined in the Environmental Assessment (EA) and regulatory requirements. Environmental activities planned for the next 12 months are also discussed.

SCOPE

This section outlines information in relation to the development, management and operation of the Duralie Coal Project by Duralie Coal Pty Ltd (DCPL) and Leighton Mining (LM). DCPL is the mine owner and LM is the contract miner.

Background to Development

The Duralie Coal Mine is located approximately 80km north of Newcastle in New South Wales, between the villages of Stroud Road and Wards River. Refer Figures 1 and 2 (Plans & Appendix (P&A) Volume).

Coal was first discovered in the Gloucester Basin in 1855 and some limited, small scale mining by hand followed.

In 1970-71 an extensive drilling programme identified coal in the Duralie area. Extensive development planning and environmental investigations took place between 1981 and 1984. Additional exploration and feasibility studies were carried out in 1993.

Development Consent for the mine was granted by the NSW Minister for Urban Affairs and Planning on 21 August 1997 and Mining Lease Number 1427 was issued by the NSW Minister for Mineral Resources on 6 April 1998.

In October 1998 a Statement of Environmental Effects (SEE) was produced to consider proposed alterations to the Duralie Mine. These proposed alterations were approved by the NSW Minister for Urban Affairs and Planning on 5 February 1999.

Construction commenced in June 2002 with mining production commencing in March 2003 and the first coal railed to the Stratford Mine for processing in the same month. DCPL received Project Approval in November 2010 for mining activities to extend until 31 December 2021.

Duralie Mine consists of an open-cut, truck and excavator mine producing run of mine (ROM) coal which is processed at the Stratford Coal Mine Coal Handling and Processing Plant (CHPP).

Coal Products and Markets

The Duralie mine produces two ROM products which are processed and blended with other ROM coals at the Stratford CHPP.

Stratford CHPP produces a coking coal and a range of thermal coal products for export.

The coking coal has excellent coking properties with fluidity, rank, swell and dilatation significantly higher than the majority of coking coal products exported through the Port of Newcastle.

The coking coal has high energy, favourable ash chemistry and high ash fusion temperatures. All of the coking coal is sold to Japan. Thermal coal is sold through export trading companies through 12 month contracts and is largely sold into Japanese and South East Asian markets.

Typical coal product qualities are shown in Table 1 below.

Table 1 - Typical Coal Qualities of Stratford Coal Products

Parameter	Gloucester Semi-hard Coking Coal	Gloucester Thermal Coal
Total Moisture	9%	6 to 7%
Inherent Moisture (ad)	1.5%	1.3%
Ash (ar)	9.9 %	19-24%
Volatile Matter	33-34%	24-32%
Total Sulphur	1.05%	0.8-2.5%
Fixed Carbon (ar)	55%	
CSN	8.5	Not applicable
Fluidity	>5000ddpm	Not applicable
Calorific Value	7550 Kcal/kg	5750-6300 Kcal/kg
HGI	55	52-60
Size	0 to 50mm	0 to 50mm

Site Personnel Responsible for Mining, Rehabilitation and Environment

Site personnel responsible for mining, rehabilitation and environmental issues at the end of the reporting period were:

Gloucester Coal - Manager Mining:	Mr Todd Hutchings
Leighton Contractors - Manager of Mining Engineering:	Mr Jon Meldon
Leighton Contractors - Mining Superintendent:	Mr Col Weildon
Gloucester Coal - Environmental Manager:	Mr Tony Dwyer

Corporate Environmental Policy

DCPL's Environmental Policy states that:

> "Duralie Coal Pty Ltd aims to maximise the recovery of economic coal reserves to supply domestic and export markets with coking and energy coals while protecting the environment for future generations.
>
> We will maintain high standards of environmental management throughout our mining and processing operations in order to meet statutory obligations and community expectations.
>
> Our guiding principles are:
>
> - Environmental management is the responsibility of everyone on site.
> - We encourage open communications.
> - We will actively minimise disturbance and impact on the surrounding environment

caused by our operations.

- We will meet current and anticipated environmental standards by utilising the best practical technologies for water quality protection and waste management.

- We will implement appropriate standards of rehabilitation to ensure minimal visual impact and the achievement of a stable final landform, along with the preservation of fauna, flora and downstream water quality.

- We will monitor and regularly assess our environmental performance and keep the local community informed through a consultative committee".

APPROVAL STATUS

Status of Leases, Licences, Permits and Approvals

The Duralie Mine has the following approvals:

- Mining Lease No. 1427 dated 6 April 1998 issued by the Minister for Minerals Resources. The lease was issued for a period of 21 years.

- Development Consent issued by the Minister for Urban Affairs and Planning dated 5 February 1999. The consent is limited to a period of 21 years from the date of a grant of a Mining Lease in respect of the Development.

- Department of Land & Water Conservation (DLWC) permit issued under the Rivers and Foreshores Improvement Act 1948 dated 4 June 2002 for the construction of a culvert crossing from protected land in or near the protected water known as: tributary of Karuah River (Permit Number 701).

- Department of Land & Water Conservation (DLWC) permit issued under the Rivers and Foreshores Improvement Act 1948 dated 4 June 2002 for the construction of the rail siding and culvert crossing across Coal Shaft Creek (Permit Number 704).

- Environment Protection Licence (EPL) No. 11701 issued by the Environment Protection Authority on 4 September 2002.

- Interim Mining Operations Plan (IMOP) (for period up until 31 December 2002 - Construction) approved by the Department of Mineral Resources (DMR) on 13 September 2002.

- DLWC Bore Licence for the Duralie Open Cut (20BL168404) dated 23 September 2002.

- DLWC Bore Licence for monitoring bores (20BL168539) dated 31 October 2002.

- DIPNR licence - 20SL060324 – relating to diversion of Coal Shaft Creek. This licence was replaced by Approval Number 20WA202053 under the Karuah River Water Sharing Plan.

- Mining Operations Plan (MOP) approved by the DMR on 28 February 2003.

- Modification to Development Consent 24 September 2003 (relating to Coal Shaft Creek).

- Site Water Management Plan approved by the DIPNR on 25 September 2003.

- Modification to existing DIPNR licence 20SL060324, dated 2 October 2003.

- Irrigation Management Plan approved by the DIPNR on 22 December 2003.
- DIPNR Bore Licence 20BL168539 had three bores added on 2 February 2004.
- Variation to Environment Protection Licence 11701 effective 9 February 2004.
- MOP Amendment approved by the DMR on 18 October 2004 (relating to an irrigation area access road).
- An attachment to the MOP by way of DCPL correspondence to the Department of Primary Industries – Mineral Resources (DPI-Minerals) dated 29 April 2005 (relating to exploration drilling within the mining lease) – approval given via email received 2 May 2005.
- Modified Irrigation Management Plan approved by the DIPNR on 23 August 2005.
- Variation to Environment Protection Licence 11701 effective 13 December 2005.
- Variation to Environment Protection Licence 11701 effective 3 March 2006.
- Approval by DPI – Minerals on 19 July 2006 for exploration drilling within an area described with the "Twin Houses Review of Environmental Factors - May 2006".
- Development Consent issued by the Minister for Planning dated 30 July 2006. This consent modifies the Development Consent granted by the Minister for Urban Affairs and Planning on 5 February 1999. The new Consent permitted the mining of the "Duralie Extended" area.
- Altered MOP plans following the approval of the "Duralie Extended" area were submitted to DPI – Minerals (refer Plans and Appendix (P&A) volume).
- Environmental Management Strategy and Blast Monitoring Program approved by the Department of Planning (DoP) on 4 April 2007.
- Air Quality and Noise Monitoring Programs approved by DoP on 24 May 2007.
- Approval by Great Lakes Council dated 24 May 2007 to erect a telecommunications tower on the Duralie Coal Mine site.
- Alterations to the MOP (eastern highwall realignment, drainage realignment) were submitted to DPI-Minerals in correspondence dated 21 June 2007 and approved via correspondence dated 30 July 2007.
- Rehabilitation Management Plan approved by DoP on 31 October 2007
- Revised Noise Monitoring Program approved by DoP on 27 November 2007.
- Revised Environmental Monitoring Program and Site Water Management Plan approved by DoP on 2 June 2008.
- Alterations to the MOP (additional eastern highwall realignment, north eastern diversion channel) were submitted to the DPI-Minerals in correspondence dated 27 May 2008 and approved via correspondence dated 18 August 2008.
- Alterations to the MOP (proposed diversion drain for proposed Auxiliary Dam No. 1) were submitted to the DPI-Minerals in correspondence dated 31 July 2008 and approved via correspondence dated 18 August 2008.
- Modification to Development Consent to allow construction of three auxiliary water storage dams by DoP on 3 December 2008.
- Revised Erosion and Sediment Control Plan (Auxiliary Dams Addendum); revised Site Water

Balance; revised Surface Water Management and Monitoring Program; revised Aboriginal Cultural Heritage Management Plan; and revised Irrigation Management Plan by DoP on 15 December 2008.

- Modification to Development Consent approving pit extension within Mining Lease 1427 by DoP on 28 October 2009.
- Variation to Environment Protection Licence dated 27 November 2009.
- Variation to Environment Protection Licence dated 13 April 2010.
- Approval by DoP of a revised Noise Monitoring Program in May 2010.
- Project Approval for the Duralie Extension Project (DEP) dated 26 November 2010.
- Issuing of Mining Lease 1646 by the Minister for Primary Industries on 4 January 2011.
- Approval of a Waste Management Plan by the Department of Planning & Infrastructure (DoPI) on 30 March 2011.
- Approval of an Environmental Management Strategy by the DoPI on 21 July 2011.

Review of Performance

A brief review of environmental performance in relation to the Office of Environment and Heritage (OEH) issued Environment Protection Licence (EPL), together with Development Consent or Project Approval conditions, is provided below. This performance is further discussed in the sections on environmental management activities and environmental monitoring.

OEH Environment Protection Licence

- Records of environmental monitoring activities have been kept.
- A record of pollution complaints has been maintained including the date and time of the complaint, method of complaint lodgement, personal details of the complainant (name and telephone number), the nature of the complaint, action taken and any follow-up contact with the complainant.
- A copy of this AR has been forwarded to the DoPI and uploaded to the Gloucester Coal Limited website (www.gloucestercoal.com.au).
- No reportable incidents involving blasting occurred during the review period (a blast over pressure above 120 dB(L) and/or ground vibration over 10mm/s) – refer Section “Vibration and Airblast”. .
- Dust suppression measures are in place. Dust monitoring to date (dust deposition gauges and high volume (PM10) air samplers) shows that current dust suppression systems have been effective and dust levels were below limits set by OEH (upon exclusion of non-dust contamination of dust deposition gauges).
- Quarterly noise compliance monitoring was undertaken in October 2010, February 2011, April 2011 and July 2011. The surveys determined that monitored mine operational noise at the time of the surveys complied with OEH noise level criteria at all monitored locations.
- On ten occasions during the reporting period sediment dams spilled. Spilling dams had an average suspended solids concentration of 94 mg/l.

Development Consent or Approval Conditions

Development Consent or Approval conditions which were met during this reporting period include those related to operation of a meteorological station, operation of dust deposition gauges and high volume (PM_{10}) air samplers, six monthly reporting of environmental monitoring, operation of a telephone complaints line, operation of a consultative committee, biological monitoring, blast monitoring, protection of an Aboriginal site ("Honey Tree"), monitoring of topsoil for Aboriginal artefacts, operation of a "blasting hotline" and employment of an environmental officer.

Certain additional obligations stemming from the 2010 Project Approval are yet to be implemented. Draft Environmental Management Plans have been provided to nominated regulators, as required, but in some instances are yet to be approved. Implementation of Project Approval conditions may, in certain circumstances, require prior agreement with specific regulators.

Amendments to Approvals/Licences over the Reporting Period

Refer *Status of Leases, Licences, Permits and Approvals*.

Dams Safety Committee

The Main Water Dam is prescribed under the Dams Safety Act 1978.

Between August 2004 and June 2008 the Dams Safety Committee (DSC) was provided with a monthly figure showing pit workings in relation to the dam. In addition, other information requested by the DSC, in the form of a monthly report, was supplied to the Committee between September 2007 and June 2008. The Committee no longer requires a monthly report and currently receives a quarterly pit layout figure.

A Dam Safety Emergency Plan (DSEP) for the Mine Water Dam was prepared and a copy supplied to the DSC in May 2006. This document was updated in January 2009. A Mine Water Dam Operations and Maintenance Manual was prepared for, and approved by, the DSC during a previous reporting period.

Routine visual inspections of the Main Water Dam are undertaken three (3) times per week. Monthly monitoring of piezometers terminating beneath the dam's clay core and within the clay core is also undertaken and water levels interpreted. Monuments located along the dam's crest were surveyed for any indication of movement during the reporting period.

The Auxiliary Dam 1 was prescribed by the DSC in October 2008 and construction completed in 2009. This dam provides supplementary storage to the Main Water Dam. A Safety Emergency Plan and an Operations and Maintenance Manual have been prepared for this dam.

Auxiliary Dam 2 (prescribed by the DSC in August 2010), a second supplementary storage dam to the Main Water Dam, was under construction during the current reporting period.

COMMUNITY LIAISON

Employment Status and Demography

As at 4 September 2011, the employment status at the mine site was as follows:

Duralie Coal Pty Ltd		8
Leightons Mining Pty Ltd	Employee	142
	Contractor	10
Interail Australia Pty Ltd		10
Ditchfield Contracting		24
Trevor Harris Contracting Pty Ltd		2
Trellis Contracting Pty Ltd		2
TOTAL		**198**

In addition to direct permanent employment at the mine, on the basis of a conservative employment multiplier of one mine site job generating one job within the general community, up to 198 (full time equivalent) jobs are expected to have been provided in supporting services. On the basis of a review of employees' living location, 59% of mine employees resided within the greater local area (defined as being bounded by Stroud, Gloucester and Dungog).

Social/Economic Contributions and Achievements

For information on community payments made by Duralie Coal Pty Ltd prior to the 2010 DEP Project Approval refer to earlier annual reports.

The 2010 Project Approval for the Duralie Extension Project made provision for altered contribution to Great Lakes Council, namely:

- $59,688.09 for the maintenance of The Bucketts Way;
- $11,022.58 for a structural inspection of bridges on The Bucketts Way (between its intersection with Clarence Town Road and the mine access road);
- $120,000 for the Karuah Catchment Management Program; and
- $100,000 for the provision of community infrastructure.

In addition, the following payments are to be made to Gloucester Shire Council (GSC):

- $15,000 for specified community works that have been agreed to between GSC and DCPL;
- $15,000 for the GSC Community Education Fund for an annual trade apprenticeship, traineeship, scholarship or equivalent; and
- $10,000 for the provision of community infrastructure.

Payments to both councils are subject to Consumer Price Index (CPI) escalation.

Significant economic benefits have flowed or are flowing into the local region from expenditure incurred at the Duralie Mine. Wherever possible and practical, DCPL prefers to utilise the services of local providers.

Liaison and Complaint Resolution

Liaison with the local community is channelled through the Community Consultative Committee (CCC). A new committee was formed following approval of Duralie Extension Project in November 2010, with two meetings (June and September 2011) held during the review period. In addition, the former committee met on two earlier occasions (November 2010 and February 2011).

DCPL operates a system to receive, handle, respond to and record complaints relating to operation of the Duralie Coal Mine.

A dedicated complaints telephone number is in place 24 hours per day. This number is 1300 788 131.

The number is advertised within the Sensis *White Pages Directory (Newcastle)*, a local telephone directory (*Pink Pages*) and in the local newspapers *(Gloucester Advocate and Dungog Chronicle)* on a six monthly basis.

Duralie staff, when notified of a complaint, determine an appropriate response on the basis of the nature of the complaint. This may involve a site visit/inspection, liaison with personnel on site by telephone or other appropriate action. All complaints are responded to within 24 hours of receipt.

All complaints received and responses taken in relation to each complaint are recorded in a Complaints Register. The Complaints Register is tabled at each Community Consultative Committee meeting for the period covered since the last Committee meeting. Fifty (50) complaints were received by DCPL which concerned the operations of the Duralie Coal Mine during the reporting period.

Community Consultative Committee

The Community Consultative Committee (CCC) for the Duralie Coal Mine is currently comprised of:

- An independent Chairperson;
- Five (5) local community representatives;
- Two (2) local government representatives (Great Lakes Council); and
- Three (3) DCPL representatives.

The CCC was formed in accordance with Schedule 5, Condition 5 of the Project Approval for the Duralie Extension Project. The Committee operates in such a manner as to generally satisfy the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007) as well as satisfy the Director-General of the Department of Planning & Infrastructure.

Issues raised and/or discussed during the last four (4) CCC meetings (two (2) under the former Committee and two (2) under the new Committee) included:

- Part 3A application (Environmental Planning & Assessment Act 1979) for mining continuity (the "Duralie Extension Project")
- New CCC members
- Biological monitoring
- Mine progress
- Monitoring (water, dust, noise, blasting, rainfall)
- Complaints
- Mine sponsored community support
- Drainage
- Collaborative environmental monitoring
- Community financial contributions
- 2010 Annual Environmental Management Report
- Chairperson's 2010 report to the Department of Planning
- Resignation of the Chairperson and Great Lakes Council representative from the 2010/11 Committee
- First flush trigger value
- Overview of current operations at the Stratford Coal Mine and status of project approvals
- Information request on "bord and pillar" method of mining
- Mr Eastoe's submission to the Land & Environment Court in relation to the Duralie Coal Mine

SUMMARY OF OPERATIONS

RESOURCE UTILISATION

Current Exploration

DCPL exploration activities are continuing to delineate the Weismantel and Clareval seams in the North West Duralie area, adjacent to ML 1646.

Reserve/Resource Status

Coal reserves for the Duralie Mine (within the current approved footprint) at the end of the reporting period have been estimated at 17.4 million tonnes.

Estimated Mine Life

Under the November 2010 Project Approval, mining of coal is permissible until 31 December 2021.

Recovery / Dilution

Mining losses and dilutions are expected to be minimal due to relatively simple geological structure, the thickness of the seam (10-12m normal thickness) and the bulk nature of the mining operation. The long term trend of coal losses of less than 2% and dilutions of less than 5% is expected to continue.

OPEN CUT MINING

Duralie is an open cut operation with a current operating stripping ratio (volume of overburden per tonne of coal) within the range 4.5:1 to 5:1. All mining operations are by truck and hydraulic excavator or shovel.

The Duralie Mine is located approximately 20km south of the Stratford Mine facilities. The workings extract coal from the Weismantel seam at the base of the Gloucester Coal Measures. The deposit forms a synclinal structure with the open cut area located at the southernmost crop line within the main axis of the Gloucester Basin. The open cut area forms a reversed “J” shape with mining commencing in the north east part of the pit progressing southward toward the “nose” of the axis then to the north west in a narrow trench. The operation now is now situated on the west limb of the syncline with seams dipping at about 50 degrees west. Recent approval of ML1646 has allowed an extension of the Wiesmantel pit to the North West of current operations and the inclusion of the Clareval seam parallel and to the west of the Wiesmantel seam.

Two types of waste have been identified within the deposit. They are categorised as potentially acid forming (PAF) or non-acid forming (NAF). Identification is undertaken by the site geologist. In the early stages of the mining operation PAF waste was placed within compacted clay cells within the out of pit waste dump. The purpose of the clay cells is to limit the potential for oxygen and water to reach the PAF material such that an acidic leachate is not produced (it should be noted that oxidation of pyrite to sulphate is required in order to produce acid). Once sufficient in pit void was available, PAF wastes were deposited below a reduced level (RL) of 63 metres. This level was deemed to be of a sufficient depth to ensure a recovering water table would submerge all the deposited PAF material and hence largely prevent oxygen reaching that material. Agricultural lime is spread across placed PAF materials

to reduce the risk of acid formation prior to clay encapsulation or submersion.

The deposition of the Weismantel and Clareval seam has been influenced by the proximity of marine environments resulting in a typically high sulphur content over the first half a metre of the seam. Additionally, moderately high inherent sulphur exists throughout the remainder of the seam.

Mining commenced in March 2003 using one hydraulic excavator (and another on standby) with three Cat 789 rear dump trucks and ancillary gear. Dips within the deposit vary from a shallow 5 degrees to an almost vertical profile. Consequently, a method of horizontal 3m to 4m benches is used as the primary extraction method. An average of 5m of free dig material is generally experienced at Duralie after which all waste material generally requires blasting.

The truck fleet currently comprises predominantly Cat 785XQ model trucks supported by a lesser number of Cat 789 trucks.

ROM Production History and Forecast

Actual ROM production for the reporting period is listed in Table 2 below by month.

Table 2 - Monthly ROM Coal Production

MONTH	ROM PRODUCTION* (tonnes)
September 2010	151,780
October 2010	154,674
November 2010	122,043
December 2010	139,059
January 2011	92,987
February 2011	101,132
March 2011	138,337
April 2011	167,398
May 2011	203,498
June 2011	176,961
July 2011	177,226
August 2011	86,333

* train weight received at Stratford Mine site

Total ROM production (September 2010 - August 2011) was 1.71 million tonnes.

Total waste mined (September 2010 - August 2011) was 9.90 million bench cubic metres (bcm).

ROM production forecast for next reporting period will be 2.5 million tonnes.

Mining Equipment and Method

The mining equipment currently in use at Duralie is listed in Table 3 provided below.

Table 3 - Current Mining Equipment (Typical Configuration)

Plant Item	Number
Excavators	3
Haul Trucks	13
Drills	2
Dozers	4
Water Carts	2
Graders	2
Loader (ROM feed)	1

The mining sequence is summarised below:

- Fauna/flora assessment (as required) is undertaken.
- A sedimentation control plan is prepared for the area to be disturbed (or an existing plan utilised).
- Sedimentation controls are implemented (as required).
- Tree clearing is limited to the minimum required for ongoing operations and undertaken ahead of the advancing face or dump. The distance is generally limited to 100m.
- Topsoil is removed in accordance with a topsoil stripping plan.
- Overburden removal is undertaken by a hydraulic excavator in backhoe configuration. Generally, the first one to five metres of clay overburden is ripped and/or free-dug. Deeper overburden requires blasting prior to excavation.
- Overburden waste material is deposited within/above a void section of the mining excavation.

Spontaneous Combustion Incidence

There were no incidents of spontaneous combustion during the reporting period.

COAL HANDLING AND BENEFICIATION

ROM Coal Processing On Site

ROM coal is processed through a rotary breaker to produce a coal fraction less than 140 mm. The essential elements of the coal processing plant on site and their design capacities are as follows:

ROM conveyor handling rate	1400 tph
Train load out rate	2400 tph

Saleable Coal Production

Product coal utilising Duralie ROM coal is produced at the Stratford Mine site. Blending of Duralie ROM coal with other ROM coals and rewashed reject material occurred during processing to produce a saleable product coal. Saleable coal production for the period September 2010 to August 2011 was 1.72 million tonnes comprising 0.68 million tonnes of coking coal and 1.04 million tonnes of thermal coal.

Actual coal production to date by month is shown in Table 4 provided on the next page.

Table 4 - Product Coal Produced by Month for Duralie and Stratford Mines

MONTH	MONTHLY PRODUCT COAL (tonnes)		
	Coking Coal	**Thermal Coal**	**Total Product Coal**
September 2010	61,565	88,469	150,034
October 2010	62,238	109,013	171,251
November 2010	43,182	74,255	117,437
December 2010	55,350	94,089	149,439
January 2011	46,649	65,341	111,990
February 2011	46,532	55,183	101,715
March 2011	52,717	75,566	128,283
April 2011	64,968	91,321	156,289
May 2011	65,206	136,777	201,983
June 2011	74,358	92,794	167,152
July 2011	62,106	86,082	148,188
August 2011	46,499	73,381	119,880

Coal Stockpile Capacity (ROM)

Duralie ROM coal stockpile capacity	15,000 tonnes
Stratford ROM coal stockpile capacity	100,000 tonnes

Product Transport

All ROM coal is transported from site to Stratford Coal Mine by rail. Railing to the Stratford site in restricted to between 7am and 10pm.

1.71 million tonnes of ROM coal was transported from the Duralie Mine in the reporting period.

821 train movements (Duralie-Stratford-Duralie circuit) occurred during the September 2010 to August 2011 period. There was a maximum daily movement of 4 trains.

MINE DEVELOPMENT

Mining of coal commenced in March 2003 after a construction period of approximately eight months. Coal mining initially involved extraction of coal from the south-eastern corner of Box Cut 1. Box Cut 1 initially lay between Coal Shaft Creek (to the west) and the Main Northern Railway Line (to the east). During the reporting period, mining of coal and waste rock was ongoing within “Strips 11-14” (Weismantel Pit) and the Clareval Pit.

During the reporting period waste rock produced was used to progress the Weismantel out of pit waste dump.

Surface facilities at the mine and current mine development as at 4 September 2011 are indicated within Figures 7-10 provided in the Plans and Appendix (P&A) volume.

ENVIRONMENTAL MANAGEMENT

MANAGEMENT AND MONITORING PLANS, PROGRAMS, STRATEGIES AND PROTOCOLS

The following documents were prepared and approved by the DoPI during the current reporting period:

- Waste Management Plan; and
- Environmental Management Strategy.

METEOROLOGICAL MONITORING

A meteorological station (i.e. weather station) is operated at the mine site as required by the Development Consent. The location of the station is shown on Figure 3 (P&A).

Rainfall

Table 5 provided below summarises the rainfall record obtained from the site Weather Station rain gauge.

Table 5 - Duralie Mine - Monthly Rainfall Records

MONTH	YEAR				STROUD DISTRICT AVERAGE[3] 1889-2010
	2011 (To Date)		2010		
	Monthly Total (mm)	No. of Rain Days/Month[2]	Monthly Total (mm)	No. of Rain Days/Month[2]	
January	56.2	9	95.6	17	115.1
February	145.6	11	75.4	14	125.9
March	62.0	19	108.6	14	145.0
April	108.4	18	29.0	8	101.1
May	108.8	12	63.6	13	90.8
June	151.0	13	98.0	13	99.2
July	123.6	10	93.4	20	74.7
August	62.0	12	57.0	7	65.2
September			30.2	4	62.3
October			110.8	13	78.1
November			170.4	14	83.6
December			92.8	8	102.9
TOTAL FOR YEAR	**817.6**	**104**	**1024.8**	**145**	**1143.9**

Notes: 1. No. of Rain Days/Month - the number of days in the month on which rain fell. (When tipping bucket rain gauge data used, a “rain day” by definition requires a minimum recording of >0.25mm comprising dew, heavy fog or light rain (or a combination thereof)).
2. Average based on Stroud Post Office records until mine site weather station commissioned in 2002.

The 2010 rainfall total for the period monitored (September to December) was 404.2 mm.

Rainfall for 2011 to date (817.6 mm) was equal to the January – August average of 817 mm.

The four driest months for the reporting period were (in order): September 2010, January 2011 and March/August 2011.
The wettest months for the reporting period were (in order): November 2010, June 2011 and February 2011.

Evaporation

Table 6 on the following page shows minimum, average and maximum evaporation rates for the reporting period. The graphical representation of the daily minimum, average and maximum evaporation rates recorded for each month during this period is provided in the Plans and Appendix volume.

Table 6 - Monthly Minimum, Average and Maximum Evaporation Rates

MONTH	MINIMUM EVAPORATION RATE (mm/day)	AVERAGE EVAPORATION RATE (mm/day)	MAXIMUM EVAPORATION RATE (mm/day)
September 2010	1.1	4.1	7.2
October 2010	0.8	4.0	8.2
November 2010	1.5	4.8	9.4
December 2010	1.8	5.7	9.9
January 2011	3.1	5.9	10.1
February 2011	0.9	5.5	12.3
March 2011	1.4	3.8	7.5
April 2011	0.7	2.8	4.6
May 2011	0.4	2.5	6.3
June 2011	0.5	2.5	7.2
July 2011	0.7	2.9	7.9
August 2011	0.9	2.5	4.1

Wind Speed and Direction

Table 7 below indicates the monthly minimum, average and maximum wind speeds for the period September 2010 to August 2011, inclusive. The graphical representation of the daily minimum, average and maximum wind speeds recorded for each month during this period is provided in the Plans and Appendix volume.

Table 7 - Monthly Minimum, Average and Maximum Wind Speeds

MONTH	MINIMUM WIND SPEED RECORDED (k/hr)	AVERAGE WIND SPEED (k/hr)	MAXIMUM WIND SPEED RECORDED (k/hr)
September 2010	0	8.0	47.4
October 2010	0	8.2	62.9
November 2010	0	8.8	39.0
December 2010	0	9.2	57.6
January 2011	0	9.1	34.6
February 2011	0	7.8	46.0
March 2011	0	7.1	70.4
April 2011	0	5.6	41.6
May 2011	0	7.4	53.1
June 2011	0	7.3	58.0
July 2011	0	9.2	54.7
August 2011	0	6.4	41.0

Table 8 provided below summarises the dominant wind directions for each month from September

2010 to August 2011, inclusive. Monthly wind roses are provided in the Plans and Appendix volume.

Table 8 - Dominant Wind Directions by Month

MONTH	DOMINANT WIND DIRECTIONS
September 2010	N
October 2010	N
November 2010	N
December 2010	N
January 2011	N
February 2011	N
March 2011	N
April 2011	N
May 2011	N, NNE
June 2011	WSW, W, N
July 2011	N, W, SW
August 2011	N

Temperature

Table 9 summarises monthly air temperatures.

Table 9 - Monthly Minimum, Average and Maximum Air Temperatures

MONTH	MINIMUM AIR TEMP RECORDED (deg C)	AVERAGE AIR TEMP (deg C)	MAXIMUM AIR TEMP RECORDED (deg C)
September 2010	1.5	15.4	28.0
October 2010	6.4	17.2	30.4
November 2010	8.5	19.5	32.4
December 2010	9.4	21.6	34.7
January 2011	14.1	23.8	42.1
February 2011	12.6	24.0	41.4
March 2011	13.9	21.1	35.5
April 2011	6.5	16.8	28.6
May 2011	1.0	12.8	24.1
June 2011	2.3	11.9	21.5
July 2011	-2.5	10.9	23.8
August 2011	1.7	12.4	25.0

The graphical representation of the daily minimum, average and maximum atmospheric temperatures recorded for each month is provided in the Plans and Appendix volume.

WATER MANAGEMENT

The main principles of the water management system on-site are to:

- Minimise the generation of dirty water;
- Minimise storage requirements by maximising re-use of dirty water;
- Remove potential impacts on downstream water resources by provision of secure containment on site and disposal by irrigation re-use;
- Implement a fail-safe system, whereby under extreme events in excess of design capacity, dirty waters would spill to the mine pit and not to the clean water catchments; and
- Not allow sediment laden water having an elevated suspended solids concentration to be discharged off site.

Water Supply and Demand

The main water supply storage on-site for use in dust suppression is the Main Water Dam (MWD) (monitoring point SW3) located to the northwest of the Industrial Area. The MWD and Auxiliary Dam 1 (AD1) are the principal permanent mine water storages on-site. At the end of the review period Auxiliary Dam 2 (AD2) also held a small volume of water. Water from these dams comprises pit produced water (runoff to/rainfall/seepage to), water from specific sediment dams and surface water runoff from the Industrial area.

The principal water losses in the water system are:

- Water applied to land by means of irrigation.
- Water used for dust suppression.
- Evaporation from the Main Water Dam, Auxiliary Dam 1 and Auxiliary Dam 2.
- Water retained in ROM coal and railed to Stratford.

Mine water stored volume increased by 176 ML during the reporting period.

The Mine Water Dam's current storage capacity is 1405 ML whilst Auxiliary Dam 1 can contain 462 ML. Auxiliary Dam 2, when completed, will have a storage capacity of 2870 ML.

At the completion of the reporting period the Mine Water Dam contained 1195 ML, Auxiliary Dam 1 held 411 ML and Auxiliary Dam 2 stored 115 ML.

It is estimated that 417 ML of water was pumped from the mine workings during the twelve month period ending 30 April 2011. This water has its origins in groundwater inflows, seepage through out of pit/in pit waste material, runoff and incident rainfall. It is not possible to distinguish between the different origins of this water which is pumped from in-pit sumps. The surface water assessment for the proposed Duralie Extension Project *("Environmental Assessment, Duralie Extension Project, Gloucester Coal Ltd, 2010")* determined that groundwater inflows into both proposed open cut pits (Weismantel Extension and Clareval North West) would, for an average year, be of the order of 172 ML. Therefore it is considered that the majority of the water pumped from the operating open cut pit during the current reporting period was derived from incident rainfall, surface runoff and rainfall seepage through waste material. The NSW Office of Water Bore Licence 20BL168404 allows for up to 300 ML of groundwater to be extracted from "works" in any 12 month period. It is therefore considered that groundwater extracted from mine workings did not exceed the 300 ML annual limit.

Surface Water Management

Surface water management is divided into the management of clean and dirty water as outlined below. Dirty water comprises both mine water and sediment laden/turbid water. Section 3.2.4 covers management of runoff from the overburden dump and sediment and erosion control.

Clean Water Management

The main objective of clean water management is the segregation of clean from dirty water by the construction of diversion drains around disturbed areas, thereby minimising the quantity of dirty water generated.

Surface water controls aim to prevent clean runoff water from entering the open mining pit and overburden dumping areas where practical. The main structures are:

- An extensive diversion drain located around the MWD – to the west of all mining activities ("Western Diversion Drain"). This drain intercepts runoff from the catchment above the MWD and delivers that water to Coal Shaft Creek. The drain was completed in early 2003;
- Diversion of Coal Shaft Creek. The diversion channel (built in stages) is required until the creek can be re-established at the conclusion of mining;
- Flood control embankments to prevent inundation of mining areas;
- A culvert under the Main Coal Haul Road which allows Coal Shaft Creek to flow through the site;
- Various runoff control drains/bunds about disturbed areas designed to divert clean water runoff around those areas; and
- Clean water diversion bunds about Auxiliary Dams 1 and 2. Auxiliary Dam 2 bunding is yet to be completed.

The main elements of the clean water diversion system are shown in Figures 7-10 (P&A Volume).

Dirty Water Management

Dirty water management refers to the control, collection and re-use of water which may have become contaminated by mining operations and associated activities or which by its nature is considered to be undesirable for release to the environment. Dirty water comprises mine water and sediment laden/turbid water. Mine water is water that has come into contact with mining activities. Sediment laden/turbid water has come into contact with disturbed areas but predominantly not core mining areas.

Mine waters are typically characterised by higher salinity and on occasion lower pH. Sediment laden waters are characterised by elevated suspended solids and elevated turbidity.

The main objectives of the dirty water control facilities are:

- On site storage to prevent escape to Coal Shaft Creek and Mammy Johnsons River; and
- Management of the stored quantity of dirty water by irrigation.

The principal sources of dirty water are:

(a) Mine Water

- Rainfall within mining pits mixing with particulate matter and relatively saline groundwater;
- Groundwater seeping into mining pits;
- Rainfall induced runoff and seepage from active sections of the overburden dump; and
- Rainfall induced runoff from the Industrial Area.

(b) Sediment Laden Water

- Rainfall induced runoff from haul roads;
- Rainfall induced runoff from areas stripped of topsoil (typically exposing clays);
- Rainfall induced runoff from areas yet to adequately vegetate within sediment dam catchments; and
- Direct rainfall falling on sediment laden water storages.

Dirty water uses and losses are:

- Evaporation and seepage losses from water storages;
- Haul road dust suppression;
- Railed coal dust suppression;
- Water retained in product coal railed to the Stratford Mine; and
- Stored water applied to land via irrigation (evapotranspiration).

The dirty water storages on site are:

- Main Water Dam (MWD)
- Auxiliary Dam 1 (AD1)
- Auxiliary Dam 2 (AD2)
- Sediment Dam VC1 (waste dump)
- Sediment Dams SD1 – SD5 (access road)
- Sediment Dams RS1 and RS6 (rail siding dams)

The locations of mine and sediment laden water storage areas are shown in Figure 7 (P&A Volume).

Surface Water Monitoring

DCPL monitors surface water quality on and surrounding the mine site by sampling from a series of selected locations. These locations comprise both streams and water storage structures. A meteorological monitoring station (i.e. weather station) provides site rainfall data. The locations of these monitoring sites are shown on Figures 2 and 8 (P&A volume).

Surface water monitoring is conducted in accordance with the Duralie Coal Mine "Surface and Groundwater Monitoring Plan (Section 2)" dated May 2002 (and updated March 2004) and the Office of Environment and Heritage (OEH) Environment Protection Licence (EPL) 11701.

Surface water is sampled and analysed on both a monthly and/or event basis. An "event" occurs when at least 20 millimetres of rainfall is received at the mine site within a 24 hour period. Note also that a

second monitored "event" must be greater than 21 days beyond the first "event" to by definition constitute an "event". It should also be noted that monitoring is also undertaken when a sediment dam is spilling.

Collected waters are analysed for a suite of physical and chemical parameters. Results are compared with the Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (2000) (Aquatic Ecosystems Table 3.4.1 referencing slightly to moderately disturbed systems) and EPA requirements. Use of the Aquatic Ecosystems criteria is considered of most relevance given that irrigation utilising water from Mammy Johnson River does not occur (or is infrequent) above Stroud Road, water from that section of the river would not normally be used for human consumption, aquaculture is not a high profile activity within the River and livestock are considered to only occasionally drink from the river.

Groundwater Management

Groundwater is monitored in order to determine whether the mine is having an observable impact on groundwater resources in the area.

DCPL monitors groundwater quality on and surrounding the mine site by sampling from a series of selected locations (bores). The location of these bores is shown in Figure 8 (P&A volume).

Groundwater monitoring is conducted in accordance with the Duralie Coal Mine "Surface and Groundwater Monitoring Plan (Section 3)" dated May 2002 (revised March 2004) and the OEH Environment Protection Licence 11701.

Collected waters are analysed for a suite of physical and chemical parameters. Results are evaluated for observable trending (refer "Review of Water Monitoring Results" below).

Sediment and Erosion Control

The control of sediment generation and erosion is primarily controlled by:

- Timely progressive rehabilitation and vegetation establishment on disturbed areas (e.g. completed sections of the overburden dump) to minimise the area exposed to erosion;
- The direction of runoff from disturbed areas into sediment dams; and
- The placement of silt fences, silt rolls (gravel filled), straw bales, geotextile fabric and/or rock in order to either trap or restrict the generation of silt or to dissipate flow energy.

All elements of sediment control are regularly monitored and maintained. Sediment dams are cleaned out when the storage volume is substantially reduced by sediment deposition (i.e. when 30% of storage volume is lost to sediment build up) and inspected after major rainfall events.

Sloping areas under rehabilitation are stabilised by structural controls such as bench drains and contour banks (if required) to break up the effective slope length exposed to erosion. Final slopes will generally not exceed 14 degrees which will aid in the control of erosion and sediment generation.

Review of Water Monitoring Results

Local Streams

Reference should be made to accompanying data tables provided in the P&A volume:

- *SW1 – Karuah River*
- *SW2 – Coal Shaft Creek*
- *SW2 Rail Culvert – Coal Shaft Creek*
- *SW2 Upstream – Coal Shaft Creek*
- *SW6 – Former RS3/4 Culvert*
- *GB1 – Mammy Johnsons River*
- *Site 9 – Karuah River*
- *Site 11 – Mammy Johnsons River*
- *Site 12 – Mammy Johnsons River*
- *Site 15 - Mammy Johnsons River*
- *Site 19 – Karuah River*

Comments on analysed parameters during the reporting period are as follows:

- pH at all sites was generally within the ANZECC guidelines. pH ranged from 6.3 (GB1 and Site 11, 24/1/11) to 8.4 (SW1, 27/6/11 and Site 19, 18/7/11).
- Electrical conductivity (EC) across all sites ranged about the ANZECC nominated band. EC above the ANZECC range is attributed to lower stream flows and groundwater influence under drier weather (especially obvious during periods of drought). EC was generally higher within Mammy Johnsons River than in the Karuah River. Also EC was generally higher within Coal Shaft Creek when compared to Mammy Johnsons River.
- Turbidity readings were generally low at all sampling locations, with the exception being when flows were high after rainfall events.
- Total suspended particulate (TSS) results in terms of average concentrations were generally similar within Mammy Johnsons and Karuah Rivers. Upstream Coal Shaft Creek demonstrated the highest TSS result. There is no stated ANZECC guideline for TSS. Elevated TSS results typically were recorded during high flow events.
- Sulphate concentrations recorded at all sites were generally low (no stated ANZECC guideline). The highest sulphate concentration recorded (325 mg/l) was for a sample collected at Site SW6 on 15 September 2010.
- Manganese concentrations recorded were generally low and within the ANZECC guideline. However, concentrations above the ANZECC guideline were recorded in two samples taken from Site SW2 Upstream (30 December 2010 and 17 January 2011 both under trickle flow). The highest result was 2.59 mg/l recorded for the January sample.
- Filtered iron concentrations at all sites were typically quite low (no stated ANZECC guideline). Highest concentration recorded (23.1 mg/l) was for a sample collected at Site SW2 Upstream on 21 July 2011.
- Zinc concentrations at all sites were also generally low. However, zinc results were quite commonly in excess of the ANZECC guideline which is extremely low. Highest concentration recorded (0.079 mg/l) was for a sample collected at Site SW2 RC on 15 February 2011.
- Aluminium concentrations at all sites were generally low. Again, the ANZECC guideline for this metal is quite low. As such, the ANZECC guideline was exceeded on a regular basis across multiple sites. The highest reading recorded was from Site SW2 Upstream on 15 February 2011 (22.4 mg/l).
- For calcium, magnesium and chloride concentrations there are no stated ANZECC guidelines. Calcium and magnesium concentrations were not high at any site (maximum 94 mg/l and 59 mg/l respectively at Site SW6 on 15 September 2010 and SW2 Upstream on 15 August 2011, respectively). Chloride concentrations were reasonably variable across the monitored sites (between 12 and 370 mg/l – maximum chloride concentration occurring at Site SW2 Upstream (Coal Shaft Creek) on 15 August 2011). Elevation in chloride concentration is routinely observed under low stream flows.

Additional analysis for selected sites was undertaken in this reporting period. The following statements refer to this additional monitoring where ANZECC Guidelines – in terms of limits - for Fresh & Marine Water Quality 2000 (Aquatic Ecosystems) under slightly to moderately disturbed systems are nominated:

- Analytes which do not exceed ANZECC guidelines at any sampled site:
  - Boron, mercury, selenium, silver, ammonia.
- Analytes which do exceed ANZECC guidelines at sampled sites:
  - Arsenic – exceedance recorded at Site 12 on 21 August 2011 (0.044 mg/l).
  - Cadmium – exceedance recorded at site SW2 Upstream on 27 June 2011 (0.0014 mg/l).
  - Copper –exceedances recorded at sites SW2 RC, SW2 Upstream, GB1, Site 9, Site 11, Site 12, and Site 19. Greatest exceedance was for a sample taken at Site SW2 Upstream on 21 July 2011 (0.015mg/l).
  - Lead – exceedances recorded at SW2 Upstream, Site 11, Site 12 and Site 19 (greatest exceedance 0.008 mg/l on 15 February 2011 at SW2 Upstream).
  - Nickel – exceedance recorded at Site SW2 Upstream on 21 July 2011 (0.014 mg/l).

Generally, analytical results for routine (excluding the additional referred to above) monitoring displayed a similar structure to the previous reporting period. However, additional metal species exceeded ANZECC guidelines when compared with the previous reporting period. This may be attributable to colloidal matter associated with erosion under higher flows.

Surface water monitoring results were consistent with predictions made in the Environmental Assessment (2010).

Biological Monitoring

As part of Duralie Coal's environmental monitoring program, Invertebrate Identification Australasia was commissioned to conduct biological monitoring of the streams near the mine. An environmental assessment of the aquatic ecosystems of Mammy Johnsons River and the Karuah River above the junction with Mammy Johnsons River was made prior to the commencement of mining operations.

Biological monitoring has been conducted during approximately March and September each year since the start of mining operations.

Monitoring conducted during this reporting period was conducted during September 2010 and March 2011. These surveys both involved sampling from eight sites. The September survey identified a total of 76 species in 51 families. The results for the March survey were 62 species in 44 families.

The September 2010 report found that *"there has been a consistent level in ecosystem condition compared to previous years and shows no evidence of any adverse effects on the aquatic macroinvertebrate community. Therefore, there appears to no adverse effects on the aquatic ecosystem as a result of the mine's operations."*

The March 2011 report reached the same conclusion.

Copies of the reports are provided in the Plans & Appendices Volume.

Mine Water

Mine water, in a practical sense, comprises water that is generated within the mine workings, waste rock emplacements (prior to an acceptable standard of rehabilitation being achieved), storage areas for such water and runoff from areas where coal is handled. Mine water is generally characterised by elevated EC, elevated sulphate concentrations and low turbidity/TSS.

The four principal mine water storage areas are the Main Water Dam (sampling location SW3 major), Main Pit (sampling location SW4), Auxiliary Dam 1 (AD1) and Auxiliary Dam 2 (AD2). Monitoring for SW3 (major) during the reporting period indicated, on average, a moderate EC (2040 uS/cm), slightly alkaline pH (7.8) and low miscellaneous metals concentration. Similar monitoring for SW4 on average indicated an EC of approximately 4400 uS/cm, slightly acidic pH (6.2) and elevated sulphate, calcium and chloride concentrations. Sulphate has its origin in sulphides present within the pit rock and coal, calcium from liming of wastes and chloride from the former marine environment.

No localised areas of lower pH water were observed within the pit during the reporting period.

On the basis of mine water quality behaviour to date, a significant change in water quality throughout the mine life is not anticipated.

Groundwater Monitoring

Monitoring of groundwater re-commenced in October 2002 in accordance with the "Surface and Groundwater Monitoring Plan". It should be noted that five (5) deep groundwater bores had been monitored for several years prior to commencement of mine construction.

The construction and early mining groundwater bore network was expanded to ten (10) bores – made up of a compliment of deep and shallow bores to obtain samples from different aquifers. During 2004 the monitoring network was expanded by a further three (3) bores for the purpose of sampling groundwater within the proposed ("Type 2") mine water irrigation area (identified as "SI" bores). In 2007 an additional piezometer (designation "DB7W) located between northern future mine workings and Mammy Johnsons River was installed. Monitoring commenced at bores DB8W, DB9W and DB10W in 2009. These bores lie between the then northern extent of the Weismantel Pit and Mammy Johnsons River.

Reference should be made to accompanying data tables for each monitoring well provided within the P&A volume.

Comments on analysed parameters for monitoring conducted during the reporting period are as follows:

- Depth to groundwater was comparable with recent historical data for most monitored wells. However, bores DB2W, DB4W and DB8W continued to show recovery from aquifer drawdown (refer to Groundwater Depressurisation below). Bore DB6W shows a rising of the water table about the bore during the reporting period;
- pH is comparable with historical data with fluctuations apparent. pH in the reporting period varied from a slightly acidic 5.2 (DB10W in November 2010) to a slightly alkaline 7.8 (SI2W in February 2011);
- Electrical conductivity generally showed a high degree of variability across many of the wells as has historically been the case. This would appear to reflect the cycle of dry and wet conditions. Shallow wells intercept generally low conductivity (fresher) aquifers;
- Calcium and magnesium concentrations across all wells tended to fluctuate within reasonably tight ranges;
- Sulphate concentrations varied across wells. Well SI3W exhibited the widest range of any well spanning over 200 mg/l;
- Aluminium concentrations are quite low (often being close to the limit of analytical detection) in all the deeper wells but comparatively higher in the shallower wells. The highest concentration recorded was 158 mg/l (BH4BW in February 2011);
- Dissolved iron concentrations showed no common trend with rises and falls across wells generally. Concentrations showed a wide range from a low of <0.05 mg/l (several wells) to a high of 152 mg/l (BH4BW in February 2011);
- Manganese concentrations across all wells were not high with the highest being 5.94 mg/l within BH4BW in February 2011; and
- Zinc concentrations were essentially low and not inconsistent with available historical data.

It would appear from the data comparison that groundwater quality is varying in a random manner,

such that some parameters are increasing, some decreasing and some remaining static when compared with historical information. This is considered to be the most common expectation of a natural groundwater system.

On the basis of the above, no mine operational activities are believed to have influenced groundwater quality as was the expectation stated in the EA.

It should be noted that the EIS described groundwater in the vicinity of the coal measures as being characterised by the following parameters/ranges:

- pH – 6.3 to 6.6
- Electrical conductivity – 1600 to 4000 uS/cm

For this reporting period, the groundwater pH range for bores likely to be influenced by the coal measures was between 5.2 and 7.5. This is wider range than that observed the previous year.

Similarly, the electrical conductivity range for the same bores was 1190 to 5680 uS/cm. This was a wider range than displayed the previous year.

Groundwater Depressurisation

Depth to water information from piezometer monitoring shows that bore water levels are generally consistent between bores and with both EIS (1996) and EA (2010) predictions.

The four bores to the west of the open cut pit (SI1W, SI2W, SI3W & DB6W) are all above or close to maximum predicted levels.

Three bores (DB1W, DB2W & DB4W) located to the east and south of the Weismantel open cut pit have previously exhibited water levels higher than the maximum predicted drawdown levels. By May 2011, bore DB1W had fully recovered any mine operational induced drawdown. Similarly, by May 2011 bores DB2W and DB4W had recovered 67% and 60% respectively of drawdown observed since June 2003. Another bore, DB5W, located south of the Weismantel open cut pit was observed to have fully recovered its mine operational induced drawdown.

Three graphs showing depth to water data by like groups of piezometers (in terms of location relative to the mining area) are provided in the Plans & Appendices Volume. The three graphs represent piezometers located between the mining excavation and Mammy Johnsons River, a single piezometer sited hydraulically upgrade of the mining excavation and the three piezometers located within the western ("Type II") irrigation area. The data has been plotted in terms of actual depth to water measurement (top of casing to top of aquifer) minus the minimum depth to water reading recorded for that piezometer. These plots show relative movement of the aquifer over time and comparisons can be made with pre-mining conditions.

The first graph ("Pit-River Groundwater Bore RL Change") shows that the maximum drawdown (expected to be largely induced by mining activity) displayed by a bore, for which extended monitoring has been conducted, is seven (7) metres – within bore DB2W. Note that drawdown has since significantly reversed within this bore as nearby excavation has been lost to waste backfilling.

The second graph ("DB6W Bore RL Change") shows that the aquifer being monitored is currently higher than prior to mining commencing in this general vicinity.

The third graph ("Western Irrigation Area Bore RL Change") indicates that depth to top of aquifer has varied by up to approximately four (4) metres within these piezometers since irrigation commenced. Note that these piezometers would be expected to show depth to water fluctuations without irrigation simply as a consequence of rainfall episodes.

Reporting

Six-monthly water monitoring data for the period commencing September 2010 was placed on the GCL website in April 2011. Data for the second six month period (commencing March 2011) is provided within this review. This review will be publicly available by being placed on the GCL website.

Water monitoring data is also provided quarterly to the CCC.

Irrigation

The Duralie Coal Mine operates under a continual stored water surplus. There is only minimal requirement for process water on site – e.g. for dust suppression and fire fighting. Development consent and project approval precludes the disposal of mine water to the local creek/river system. As a consequence, mine water accumulates on site if not actively drawn down.

Irrigation, as proposed within the Duralie EIS and EA, is used to draw down stored water. Irrigation currently consists substantially of a network of fixed sprays supported by travelling irrigators.

The application of mine water is subject to a management plan (Irrigation Management Plan).

In order to ensure irrigation of mine water does not have an unacceptable adverse impact upon the environment (particularly soils, vegetation, off site water quality etc) appropriate monitoring is undertaken. The monitoring includes (or in the past has included) evaluation of irrigation source water quality, soil moisture levels, runoff water quality from areas under irrigation, soil macroinvertebrates, plant species diversity and pasture biomass.

Determination of soil moisture levels to rank irrigation priorities is undertaken using a combination of automated moisture probe sensing and manual downloading of “Gbug” sensor/loggers.

During the review period (September 2010 to August 2011) approximate irrigation volumes for Type II/III areas were:

Type II areas – 875 hours (compare with 2659 hours last reporting period) of travelling irrigator operation corresponding to an on ground application of 63 ML.
Type III areas – 309 hours (compare with 2306 hours last reporting period) of travelling irrigator operation corresponding to an on ground application of 22 ML.

Therefore 85 ML of mine water was irrigated within Type II/III areas utilising travelling irrigators during the review period (compared with 316 ML the previous reporting period). Note that the northward advance of mining operations had rendered the entire Type III irrigation area unavailable for irrigation prior to the completion of this review period.

During this review period a fully automated, fixed spray irrigation system, operating on a trial basis, was installed, commissioned and run, within the Type II irrigation area. This system replaced travelling irrigators within the immediate area the sprays were installed. On evaluation, the trial operation was considered successful.

The automated, fixed spray irrigation system applied an estimated 92 ML of water to ground within the trial area during the months of January and February 2011.

It is anticipated that automated, fixed spray irrigation will progressively replace use of travelling irrigators over time. Automated, fixed sprays are considered to provide finer control of the application of irrigated water when compared with travelling irrigation units.

Indicative soil sampling within irrigated areas has been undertaken in August each year since 2005 and tested for analytes of interest, namely bicarbonate alkalinity, chloride, sulphate, calcium, sodium and

magnesium concentrations in order to determine whether there was any significant salt accumulation within irrigated topsoils.

It should be noted that there is naturally occurring variation in elemental composition between locations and even about an actual location. This situation is clearly indicated by analytical results from the non-irrigated sampling site ("Reference" site).

Comparisons by run when comparing average results for the years 2005-07 and 2010-11[1] (relative to the reference (non irrigated) site) were:

Run 10: Increased concentrations: electrical conductivity, bicarbonate alkalinity, sulphate, calcium, sodium.
Decreased concentrations: chloride, magnesium.

Run 16: Increased concentrations: electrical conductivity, sulphate, chloride, sodium.
Decreased concentrations: bicarbonate alkalinity, calcium, magnesium.

Runs 32 and 33 (Type III irrigation area) were reported in the 2010 AEMR but are not reported in this AR. Irrigation on these runs had been discontinued by 2011 as a consequence of these areas being impacted by pending or actual mining disturbance as indicated above.

Analytical results are provided in the Plans and Appendix Volume.

Indicative photographic recording of irrigation area vegetation was undertaken in December 2010 and July 2011.

Water quality for the Main Water Dam ("SW3") in terms of a comprehensive metals suite was undertaken on a monthly basis during the review period. Analytical results are provided in the Plans and Appendix Volume (Surface Water Monitoring section).

Re-establishment of Coal Shaft Creek

No additional works associated with the re-establishment of Coal Shaft Creek occurred during this review period.

CSC Diversion – a photographic surveillance record of key structures along the diversion was undertaken during September 2011.

Site Water Balance

A review of the Main Water Dam balance 2010-2011 is as follows:

Inflows (Megalitres per annum)

Pump from open cut pit to Mine Water Dam (MWD)	417
Pump from sediment dams	31
MWD rainfall-runoff	397
MWD upstream seepage	226
Western area irrigation "first flush" collection & Auxiliary Dam 1 seepage	111
Total Inflow	1182

Outflows (Megalitres per annum)

Irrigation	600
Evaporation	269

[1] Analytical results for 2008 and 2009 years were excluded on basis of anomalous results.

Haul Road/Drill use (dust suppression)	121
Pump to Auxiliary Dam 1*	111
Total Outflow	1102
Mine Water Dam Net Gain (Megalitres per annum)	**80**

Complaints

During the reporting period there were two (2) water related complaints received. These complaints related to surface water quality on private property adjacent to the Duralie Coal Mine. This issue was investigated by the Environment Protection Authority who concluded that water quality within the area of interest had not been impacted by any operations of the Duralie Coal Mine.

EROSION AND SEDIMENT MANAGEMENT

The mine had the following dedicated erosion and sediment control structures in use during the reporting period (refer Figure 7 in P & A Volume):

Five (5) access road sediment dams – designated as SD1 to SD5
Two (2) rail siding sediment dams – designated as RS1 and RS6
One (1) waste dump sediment dam – designated as VC1

Sediment dam sizing is based on providing sufficient capacity to hold runoff from a 1 in 20 year, 1 hour duration rainfall event (for a given catchment). Runoff in excess of such an event will result in a dam spilling in accordance with the design criteria. The quality of water collecting within sediment dam is managed (where practical) to minimise suspended sediment load. This is achieved by a combination of promoting stabilising groundcover within the dam's catchment and introduction of a flocking agent such as gypsum (as required).

Sediment dams are inspected following receipt of sufficient rain whereby such dams have the potential to spill.

In addition to dedicated sediment dams, clean water is directed around disturbed areas (where practical) using diversion drains/bunds or in the case of Coal Shaft Creek, a creek diversion (refer discussion under *Water Management*) in order to minimise sediment laden water.

Results of monitoring are provided with the table "Sediment Dams – Monitored During Rain Periods" (provided in the P&A Volume). Spills occurred from five (5) separate dams – SD1-SD5 (inclusive) – all located off the sealed site access road. Note that for the purpose of this discussion spilling over consecutive days is considered to constitute "one occasion". Dam spills occurred during November 2010, December 2010, April 2011, June 2011, July 2010 and August 2011.

It should be noted that at all times pumping (where possible) of sediment dams in order to prevent or limit the amount of spilling water was undertaken. Prioritisation of pumping operations also took into account the likely quality of spilling water when a dam was considered vulnerable to spilling.

AIR

Dust Monitoring and Criteria

DCPL has an Air Quality Management Plan (AQMP) that establishes a dust management strategy which:

- Identifies air quality criteria;
- Outlines proactive and responsive dust management and control measures;
- Establishes dust management protocols;
- Formulates an air quality monitoring programme;
- Establishes stakeholder consultation protocols; and
- Details reporting and review requirements.

The AQMP was produced in July 2002 (and augmented by an Air Quality Monitoring Plan approved by the DoP in May 2007) and provided to the EPA (now OEH), Planning NSW (now DoPI), Great Lakes Council and members of the CEMCC.

In order to monitor air quality (dust) surrounding the mine site, DCPL utilises a network of six (6) static dust fallout gauges, two (2) high volume PM_{10} air samplers and a meteorological monitoring station (i.e. weather station). The locations of these monitoring sites are shown on Figure 3 (P&A volume).

Monthly dust fallout levels are measured so that dust deposition rates in g/m^2/month can be determined at or near three (3) residences along Johnsons Creek Road (east of the mine site) and within the village of Wards River. The EPA annual average limit for dust deposition is $2.5g/m^2$/month with a monthly maximum of $4g/m^2$/month.

The high volume air samplers (HVAS) (PM_{10}) are set up near company owned rural dwellings along Johnsons Creek Road ("Twin Houses" – located to the northeast of the mine and "High Noon" – located to the southeast of the mine). Sampling occurs for a 24 hour period every 6 days in accordance with AS 2724.3. The OEH goal for air quality is an annual average limit of $30ug/m^3$/day and a National Environmental Protection Measure (NEPM) 24-hour average limit of $50ug/m^3$/day.

Dust Control Procedures

Dust is controlled by methods which include:

- Minimising disturbed areas,
- Prompt reshaping, topsoiling and revegetation;
- Watering haul roads and other dust generating roads;
- Utilising water sprays on the drill;
- Water sprays on the ROM dump hopper and transfer point between the ROM and train loading bins; and
- Water sprays during train coal loading.

Review of Dust Monitoring Results

Dust Deposition Gauges

Graph 1 shows the dust deposition results for the six (6) dust deposition gauges (D1-D5, D7). Gauge D7 is located within the village of Wards River. The monthly results for deposited dust are tabulated below:

Table 10 – Dust Deposition Gauge Results

	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11
D1	3.0	3.5	6.5	2.5	5.3	3.7	2.8	1.8	3.6	2.0	2.7	4.0
D2	2.1	1.5	7.0[I]	3.3	1.0	2.1	1.8	2.3	0.9	2.4	1.1	1.6
D3	2.2	1.9	1.0	5.0[I]	0.5	3.1	6.1[B]	1.4	8.4[B]	11.7[I,V]	2.7	1.1
D4	3.6	1.6	4.8[I]	10.7[B]	0.2	0.5	6.3[B]	0.4	0.4	0.4	0.8	0.7
D5	20.8[I, A]	0.5	3.8	17.1[F]	1.0	1.0	0.6	3.1	2.6	5.3[I,V]	2.3	0.9
D7	1.4	0.5	0.5	1.3	0.7	0.7	0.4	0.3	0.3	0.8	0.5	0.3
EPA limit	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

Notes/excluded results: "I" = significant insect contamination
"B" = significant bird droppings
"V" = significant vegetation present
"A" = significant algae present
"F" = broken funnel, glass contamination of sample

Dust levels recorded had an average value of 1.8 g/m^2/month (excluded results not counted). On two (2) occasions (after excluded results) during the reporting period a deposition gauge result exceeded 4 g/m^2/month (both for gauge D1) and elevated values were at times affected by various degrees of contamination from insects, bird droppings, vegetation (seeds/grasses), algae and glass fractions. Dust gauge D1 had, on occasion, higher results – largely attributed to the close proximity of the gauge to on site vehicular traffic. The results should be compared with the OEH upper limit of 4 g/m^2/month and the annual average limit of 2.5 g/m^2/month. Dust gauge results are provided within Graph 1 (P&A Volume). Note that this graph includes all results including those with significant quantities of non-dust contamination.

Contamination of all samples routinely occurred – primarily from insects and bird dung.

Graph 2 (P&A Volume) shows the running/cumulative monthly averages for dust deposition gauges. This figure shows that the average dust deposition level for all monitoring sites and the 2.5 g/m^2/month annual average limit as set by the OEH. Running/cumulative results are directly impacted by non-dust

High Volume (PM_{10}) Dust Samplers

Graph 3 (P&A Volume) shows the high volume air sampler (HVAS) (with heads restricting dust capture to particle size less than 10 micrometre – ie PM_{10}) monitoring results for the two HVAS in ug/m^3/day (24 hours) for the monitoring sites at "High Noon" and "Twin Houses" during the reporting period.

Analytical data indicated that both monitoring locations (in terms of monitored days) did not exceed the National Environmental Protection Measure (NEPM) of 50 ug/m^3/day during the reporting period.

The results during the reporting period by monitoring location were: "High Noon" 3.3 to 31 ug/m^3/day and "Twin Houses" 2.9 to 38 ug/m^3/day.

HVAS results are tabulated on the following page.

Table 11 – High Volume Air Sampler Results

Date	High Noon	Twin Houses	Date	High Noon	Twin Houses
05-Sep-10	4	4	16-Mar-11	6.9	7.4
11-Sep-10	31	14	22-Mar-11	6.2	6.4
17-Sep-10	7	16	28-Mar-11	5.6	5.7
23-Sep-10	16	36	03-Apr-11	10.5	13
29-Sep-10	20	38	09-Apr-11	6.1	5
05-Oct-10	6	6	15-Apr-11	7.7	17.7
11-Oct-10	10	10	21-Apr-11	8.3	12.2
17-Oct-10	5	6	27-Apr-11	4.5	4.8
23-Oct-10	9	8.1	03-May-11	6.5	6.4
29-Oct-10	14.5	18	09-May-11	9.4	7.2
04-Nov-10	8.7	19	15-May-11	4.4	9.1
10-Nov-10	10.5	9	21-May-11	5.5	10.3
16-Nov-10	6	5.2	27-May-11	4.1	4.9
22-Nov-10	7.2	8.6	02-Jun-11	4.5	5.4
28-Nov-10	11.4	15.5	08-Jun-11	4.5	10.3
04-Dec-10	8.8	6.4	14-Jun-11	5.9	6.8
10-Dec-10	8.4	5.9	20-Jun-11	5.2	8.8
16-Dec-10	8.7	8.3	26-Jun-11	7	9.8
22-Dec-10	11.1	12.7	02-Jul-11	3.3	2.9
28-Dec-10	11.6	11.2	08-Jul-11	4.9	10.4
03-Jan-11	9.4	10.4	14-Jul-11	4	7.1
09-Jan-11	7.6	7	20-Jul-11	3.5	3.4
15-Jan-11	11.2	12.3	26-Jul-11	4.3	7.6
21-Jan-11	5.8	6.4	01-Aug-11	9.8	19
27-Jan-11	12.7	19.1	07-Aug-11	9.2	7.5
02-Feb-11	15.7	18.9	13-Aug-11	5	5.8
08-Feb-11	9.6	9	19-Aug-11	3.7	5.2
14-Feb-11	8	7.5	25-Aug-11	4.8	5.3
20-Feb-11	14.2	13.6	31-Aug-11	5.6	7.6
26-Feb-11	12.4	13.4			
04-Mar-11	13.7	16.3			
10-Mar-11	10.9	9.2			

Graph 4 (P&A Volume) shows the running/cumulative average for the two HVAS during the reporting period. The running average for the "High Noon" ranged between 8.5 and 12.2 ug/m^3/day whilst "Twin Houses" ranged between 10.0 and 13.7 ug/m^3/day. Thus, annual averages for both sampling locations were below the 30 ug/m^3/day EPA recommended limit.

Reporting

Six-monthly air quality monitoring data for the period commencing September 2010 was placed on the GCL website in April 2011. Data for the second six month period (commencing March 2011) is provided within this report and which will also be publicly available by being placed on the GCL website.

Air quality data is also provided quarterly to the CCC.

Complaints

Five (5) complaints relating to air quality issues were received during the reporting period. Some of these complaints were attributed to dust and/or fume generated during blasting operations.

National Pollutant Inventory

The Duralie Coal Mine provided a National Pollutant Inventory (NPI) report to the NSW EPA for the twelve month period ending June 30, 2010. The presentation of Duralie Coal's emission data on the Federal Government's NPI website) is provided within Appendix II (Environmental Monitoring Data).

Duralie Coal's report for the twelve month period ending June 30, 2011 will be provided in the next AR.

Greenhouse Gas Emissions

With reference to the "National Greenhouse Accounts (NGA) Factors, January 2008" published by the Federal Department of Climate Change, this document categorises activity-specific emissions as "direct/scope 1" if they occur as a consequence of actions on a mine site and "indirect/scope 2 and scope 3" in they are occur as a consequence of actions beyond that mine site. "Scope 2 emissions" are considered to be "allocated to the organisation that owns or controls the plant or equipment where the electricity is consumed." In the case of DCPL, a power station, were it to burn coal to generate electricity for use at the Duralie Coal Mine, would be considered to produce *Duralie specific* "Scope 3 emissions".

Emissions, as reported in the 2009/2010 National Greenhouse and Energy Report on behalf of Gloucester Coal Ltd, in terms of the Duralie Coal Mine were as follows:

Scope 1 Emissions – 32,281 tonnes CO2-e
Scope 2 Emissions – 1,884 tonnes CO2-e

Energy Saving

The site's Electrical Energy Savings Action Plan (EESAP) was produced in 2006. It makes provision to benchmark the previous one (or two) years production (feed tonnes) and energy / demand consumption and greenhouse gas allocation.

The EESAP states that practical energy and demand initiatives will be evaluated and implemented where economically justifiable.

Principle uses of electrical energy at the Duralie Coal Mine are in the areas of:

- Water pumping, predominantly as part of irrigation activities;
- Operation of conveyor belts; and
- Lighting.

Refer to past annual reports for earlier energy savings initiatives.

The second annual report on energy savings was provided to the NSW Government at the end of June 2011.

NOISE

Noise Criteria and Control Procedures

A Noise Management Plan (NMP) was initially produced in December 2002 (and supplemented by a Noise Monitoring Plan approved by the DoP in May 2007 for which a revision was also approved by the DoP in May 2010) to develop procedures for the management of noise emissions during the construction and operation of the Duralie Coal Mine. The NMP was provided to Great Lakes Council, EPA, Planning NSW and members of CEMCC. Subsequent versions of the Noise Monitoring Plan have been provided to the Department of Planning and members of the Community Consultative Committee.

Under the 1999 Development Consent, DCPL was required to undertake six monthly noise monitoring surveys, as part of its Development Consent, which involve measuring and recording the Leq (15minute) noise level at locations specified by the EPA in order to assess compliance with noise limits imposed on the mine.

The 2006 Development Consent Modification required quarterly noise monitoring and nominated Leq (15minute) noise limits at a series of nearby privately owned properties. The Noise Monitoring Plan approved in 2007 provided a framework for quarterly monitoring and addressed the requirements of the EPL with respect to noise monitoring.

A variation to the EPL was effected in April 2010 and provided for altered noise monitoring locations deemed necessary as a consequence of changes to property ownership. EPL designated monitoring locations are “AAAS1 Woodley”, “AS2 Hattam” and “AAS3 Bailey”.

Four (4) noise surveys were conducted during the reporting period. These surveys were conducted during October 2010, February 2011, April 2011 and July 2011.

Review of Noise Survey Results

The results of the October 2010, February 2011, April 2011 and July 2011 surveys are provided in Table 12. Noise monitoring locations are shown on Figure 4 which is located in the P & A Volume.

Table 12 – Contributed Mine Noise During Surveys

October 2010 Survey

Monitoring Location[1]	Mine Contribution $LAeq_{(15\ minute)}$ for Day 19-20/10/10	Mine Contribution $LAeq_{(15\ minute)}$ for Evening 19/10/10	Mine Contribution $LAeq_{(15\ minute)}$ for Night 19-20/10/10	Noise Limits day/evening/night $LAeq_{(15\ minute)}$	Excursion dB(A) $LAeq_{(15\ minute)}$
AAAS1 Woodley	nil	nil	26, <27	35	0
AS2 GCL(ex Hattam)^	<20	38	47,50	n.a.	#
AAS3 GCL(ex Bailey)	nil	nil	<30, 37	n.a.	#
Gillard	nil	nil	nil, 27	35	0

 # Note that since this property is owned by GCL the noise limit does not apply.
^ house not occupied.
n.a.= not applicable

February 2011 Survey

Monitoring Location[1]	Mine Contribution LAeq(15 minute) for Day 9/02/11	Mine Contribution LAeq(15 minute) for Evening 9/02/11	Mine Contribution LAeq(15 minute) for Night 9-10/02/10	Noise Limits (day/evening/night) LAeq 15 minute)	Excursion dB(A) LAeq(15 minute)
AAAS1 Woodley	nil	nil	nil, <20	35	0
AS2 GCL(ex Hattam)	38	39	48, nil	n.a.	#
AAS3 GCL(ex Bailey)	nil	33	24, nil	n.a.	#
Gillard	nil	nil	nil, 20	35	0
Morgan[@]	23	24	33, nil	35	0

 # Note that since this property is owned by GCL the noise limit does not apply.
[^] House not occupied.
n.a.= not applicable
[@] Prediction based assessment.

April 2011 Survey

Monitoring Location[1]	Mine Contribution LAeq(15 minute) for Day 13/04/11	Mine Contribution LAeq(15 minute) for Evening 13-14/04/11	Mine Contribution LAeq(15 minute) for Night 13-15/04/11	Noise Limits (day/evening/night) LAeq(15 minute)	Excursion dB(A) LAeq(15 minute)
AAAS1 Woodley	nil	<20	30, 29	35	0
AS2 GCL(ex Hattam)^	<46	38	42, 44	n.a.	#
AAS3 GCL(ex Bailey)	nil	nil	28, 23	n.a.	#
Gillard	nil	nil	nil, 20	35	0
Wards River Village[@]	nil	nil	27, <22	35	0

 # Note that since this property is owned by GCL the noise limit does not apply.
[^] House not occupied.
n.a.= not applicable
[@] Prediction based assessment.

July 2011 Survey

Monitoring Location[1]	Mine Contribution LAeq(15 minute) for Day 13/07/11	Mine Contribution LAeq(15 minute) for Evening 12-13/07/11	Mine Contribution LAeq(15 minute) for Night 12-14/07/11	Noise Limits (day/evening/night) LAeq(15 minute)	Excursion dB(A) LAeq(15 minute)
AAAS1 Woodley	<30	<32	32, nil	35	0
AS2 GCL(ex Hattam)^	46	47	40, 45	n.a.	#
AAS3 GCL(ex Bailey)	39	<33	<36, 37	n.a.	#
Wards River Village	nil	<26	<28, 24	35	0
Holloway	<34	34	34, 29	35	0
Kelleher[*]	<32	<32	<34, <32	35	0

 # Note that since this property is owned by GCL the noise limit does not apply.
[^] House not occupied.
n.a.= not applicable
[*] Measurements taken approximately 175m from dwelling.

The four noise surveys conducted during the reporting period concluded that the Duralie Mine was compliant with the EPA (now OEH) noise level criteria at all privately owned monitored locations under the prevailing atmospheric conditions.

Mobile Plant Noise Assessments

Key items of mobile plant – typically haul trucks – are regularly assessed for noise outputs. Availability of mobile plant for noise testing is subject to production requirements and servicing/maintenance/breakdowns.

Noise assessments of haul trucks occurred in February 2011. No significant deterioration of noise performance for any individual truck was detected.

The 2010 EA provides predictions on mine contributed noise emissions for various operational years. Year 3 in the most applicable predictive year available. In terms of the three OEH licensed monitoring locations ("Woodley", "ex-Bailey" and "ex-Hattam") predicted mine contributed noise emissions were consistent with measured values for both the "Woodley" and "ex-Bailey" locations. In the case of "ex-Hattam", recorded mine contributed noise values on occasion were greater than predicted emissions. It should be noted that the "ex-Hattam" property is owned by Gloucester Coal Limited and noise impacts are expected due to proximity to mine operational areas.

Complaints

Twenty two (22) noise related complaints were received by DCPL during the reporting period.

VIBRATION AND AIRBLAST

Blast Criteria and Control Procedures

Blasting is conducted in accordance with a Blasting/Vibration Management Plan (BVMP). Blasting limits are imposed by the site's EPL. The requirement to monitor blasts for ground vibration and overpressure is contained with the EPL, Development Consent conditions and the Mining Lease (ML 1427).

Permanent blast monitors during the review period were located on the Schultz Property (Bucketts Way, south west of mine); ex-Hattam Property (Johnsons Creek Road, north east of mine) and the ex-Bailey Property (Martins Crossing Road, north of mine). Blast monitoring at the former Weismantels Inn was established during the review period.

The locations of the permanent blast monitoring locations are shown on Figure 5 (P&A volume).

The EPL conditions state that overpressure caused by blasting at monitored locations may exceed 115 dB(L) for 5% of blasts during the reporting period but must not exceed 120 dB(L) at any time. Similarly, ground vibration at monitored locations caused by blasting may exceed a peak particle velocity of 5 mm/s for 5% of blasts during the reporting period but not exceed 10 mm/s.

A "blasting hotline" was established to satisfy a Development Consent condition issued in 2006. This system allows the public to telephone a dedicated number (65 384 213) and be advised of intended blasts. Persons living within two (2) kilometres of an active or approved operational area can also request advice of blasting. Such advice is delivered by mobile telephone text messaging or a telephone voice call.

Dilapidation (structural) surveys of several privately owned dwellings located in the vicinity of the mine are routinely carried out by an independent structural engineer. In addition, surveys may be commissioned following an approach by a landowner concerned about dwelling damage which they consider may be related to mining activity.

Several dilapidation surveys were conducted on privately owned dwellings during the review period.

Review of Blast Monitoring Results

The airblast overpressure and ground vibration results for all blasts undertaken during the review period are shown in the Appendices Volume.

Review of Overpressure Results

During the review period (period ending 4 September 2011) there were no blasts where overpressure exceeded 120 dBL.

In addition, there were seven (7) blasts where overpressure exceeded 115 dBL. All but one of these seven blasts recorded an overpressure in excess of 115 dBL at the ex-Hattam monitor alone. As stated previously, the ex-Hattam property is owned by Gloucester Coal Limited.

Review of Vibration Results

During the review period (period ending 4 September 2011) there were no blasts were ground vibration exceeded 10 mm/s and three (3) blasts where ground vibration exceeded 5 mm/s. All blasts which resulted in ground vibration exceeding 5 mm/s were recorded at the ex-Hattam monitor.

Complaints

There were eleven (11) complaints which referred to blasting received during the review period.

OTHER ENVIRONMENTAL COMPLAINTS

There was no additional complaints which would be categorised other than those categories already discussed.

COMPLAINT SUMMARY

Complaints (by category) received by Duralie Coal Pty Ltd (Duralie Coal) over the last 6 reporting years are as follows:

	05/06	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**
Noise	16	16	23	19	22	22
Blasting	0	0	0	4	11	11
Air Quality	0	2	0	0	3	5
Water	0	0	0	1	0	2
Lighting	0	0	0	0	0	1
Train Offsite	0	2	0	0	0	1
Speeding Vehicles	0	1	0	0	0	0
Notification	0	0	0	1	2[$]	1
Total* (by Category)	**16**	**21**	**23**	**25**	**36**	**43**

* Note that a single complaint may involve multiple categories.
$ Counted in another category.

Comments

- Years 2009/2010 to 2010/2011 produced the same number of noise and blasting complaints. Noise complaints constituted the most populous category of complaints received.
- Total number of complaints received by category during 2010/2011 increased by seven (7) from the previous year.
- Duralie Coal's Office of Environment and Heritage (OEH) Environment Protection Licence (EPL) 11701 applies to the area over which the NSW Department of Trade & Investment, Regional Infrastructure and Services (DTIRIS) Mining Leases 1427 and 1646 are issued. A requirement of the EPL is to record pollution complaints regarding complaints stemming from operations within the nominated Lease areas and hence complaints relating to coal trains operating off the mining lease, speeding vehicles on public roads and exploration drilling not on the Duralie Mining Leases are not within the scope of the EPL complaint recording obligation upon Duralie Coal.

A complaints listing is provided in the Appendix Volume (DoP only).

NATIONAL POLLUTANT INVENTORY

National Pollutant Inventory (NPI) reporting for the 2009/2010 reporting year was submitted in September 2009 and the 2009/2010 submission will be made during September 2010.

The NPI report as listed on the Commonwealth Department of the Environment and Heritage website (http://www.npi.gov.au) for the 2009/2010 reporting year is provided within the Plans & Appendices Volume.

COAL WASHERY REJECTS / REJECT MANAGEMENT

Handling and Disposal Procedures

Rock greater than 140mm is removed from ROM coal using a rotary breaker at the Duralie Mine. The separated rock is conveyed to a bin from which it is loaded out and trucked to be buried on site as potentially acid forming (PAF) waste. All other reject fractions are generated at the Stratford Mine and deposited along with processing waste fractions produced from the washing of Bowens Road North and Stratford deposit coals.

Refer to the Stratford Coal Mine AEMR for details regarding the handling and disposal of reject material at the Stratford site.

Chemical Characterisation of Wastes

Waste rock has been previously analysed as part of the EIS.

Chemical characterisation of wastes during the reporting period has consisted of:

- geochemical (NAG – nett acid generating) testing of waste rock profiles.

Chemical characterisation of wastes was also supported by assessment of pit sump and other mine water pH's.

To date, there have been only isolated incidences of acid formation (e.g. within the "Strip 3" pit area – occurring approximately 2004). Acidic water, when found, has been treated by ground limestone addition.

OTHER WASTE MANAGEMENT AND RECYCLING

Sewerage Treatment and Disposal

Sewage treatment at the mine site involves a single system that manages all generated sewage. Sewage is processed using a Garden Master 7100 Elite Aerated Waste Water Treatment System. The system works on the combined principles of primary settlement and aerobic treatment. Treated effluent is discharged via a spray system into a grassed area located to the southwest of the Main Office.

These sewage treatment facility is registered with Great Lakes Council.

Fuel Containment

Fuel (diesel) storage at the mine site consists of a single 110,000 litre capacity above ground bunded storage tank. The storage area is subject to Dangerous Goods Acknowledgement Number 35/036328 (Workcover NSW).

Oil and Grease Containment and Disposal

Bulk oil is stored within a bunded area.

Used engine oils (lubricating oils) and hydraulic oils are recovered during plant and vehicle servicing in the workshop and in the field.

Within the workshop area, separate bunded areas hold a 5,000 litre waste oil tank and bulk oils and greases (tanks and drums). A washpad is utilised to clean vehicles and plant either prior to leaving site or for general servicing/repair. Off the washpad is a concrete sump which serves to trap silt and from which oil is removed using a skimmer. Waste oil collected is removed from site by a commercial contractor for subsequent recycling off-site.

In addition, Interail – the train contractor at site – provides temporary storage for waste oil prior to periodic removal by the waste oil contractor who services the Duralie site. Waste oil is stored in 200 litre drums mounted upon a bunding device.

Contractors are generally required to manage and remove from site all waste oil generated during their operations.

Used Tyres

Tyres were buried within backfill during the reporting period. Disposal was undertaken in accordance with earlier received advice from the EPA in the following manner:

- Tyres are placed in discrete lots and buried with a minimum cover of 5 metres;
- Disposal sites are adequately recorded for future reference. The depth of disposal is also recorded;
- Tyres stockpiled for disposal are adequately protected from fires; and
- Tyres disposed of are not placed with any other combustible material.

Rubbish Disposal

All domestic rubbish (e.g. food scraps, paper etc) is deposited in industrial rubbish bins which are periodically emptied by a waste contractor for subsequent disposal.

Scrap metal produced by the Leighton Mining workshop is collected and transferred off site by a scrap metal merchant. The merchant collects the scrap metal whenever the bins become full.

Paper, cardboard and aluminium drink cans are collected for recycling.

All contractors are responsible for the collection and removal of their own rubbish.

HAZARDOUS AND EXPLOSIVES MATERIALS MANAGEMENT

Hazardous materials are stored and used in accordance with relevant material safety data sheets (MSDS). MSDS's are kept in a file inside the First Aid Room and are available from an online database.

Status of Dangerous Goods Approval

An "Acknowledgement of Notification of Dangerous Goods on Premises" (Acknowledgement Number 35/036328) with an expiry date of 15 October 2011 issued by Workcover NSW is held by Leighton Contractors Pty Ltd. This Acknowledgement addresses:

- Above-ground tanks (diesel)
- External magazine (detonators & boosters)
- Above-ground tank (oxidizing liquid)
- Roofless bulk storage (ammonium nitrate)

CULTURAL AND NATURAL HERITAGE CONSERVATION

Archaeological surveys conducted at the Duralie Mine site in the 1980's and 1990's did not identify any Aboriginal sites or items with the exception of one site. A tree, to be subsequently referred to as the "honey tree" was the subject of a site inspection involving various parties including representatives of NPWS in November 1998. The consensus at the time of inspection was that the "honey tree", an old ironbark, had had timber pieces inserted into the trunk in a spiral pattern to allow someone to scale the tree and access the crown – possibly to collect honey. It was not clear whether such timber insertion would have been performed by an Aboriginal person or early European settler. The "honey tree" was subsequently listed on the NPWS Aboriginal Heritage Information Management System (AHIMS) database.

The "honey tree" is located between the eastern extent of the mining excavation and the Main Northern

Railway Line. The tree has been protected by erection of a painted post and rail fence about the tree. Signage on the fence directs persons not to enter the area.

The Duralie Mine has an Aboriginal Heritage Management Protocol (AHMP), the purpose of which is to address the requirements of development consent condition 41, namely:

(a) The Honey Scarred Tree as identified by NPWS shall not be disturbed; and
(b) In the event that artefacts are identified on the site during development through earthworks, construction or operation of the coal mine, the Applicant shall contact the NPWS and cease work in the relevant location pending investigation of its heritage value.

In accordance with the AHMP topsoil disturbance during earthworks, construction and operation of the mine has been monitored utilising officers of the Karuah Local Aboriginal Land Council (KLALC). During the reporting period KLALC officers did not report any Aboriginal artefacts.

During preparation of the Environmental Assessment (EA)[#] for the proposed Duralie Mine Extension in 2009, two archaeological site inspections identified a total of nine Aboriginal heritage sites within the study area, some of which are located within the current Mining Lease area. These 9 sites are tabulated below:

Site Code (refer EA documentation)	Site Type	Status
DM2	Isolated Artefact	Existing
DM3	Scarred Tree	Existing
DM4	Scarred Tree	Existing
DM5	Scarred Tree	Existing
DM6	Isolated Artefact	Existing
DM9	Open Artefact Scatter	Existing
DM10	Scarred Tree	Existing
DM11	Isolated Artefact	Existing
38-1-0033	Scarred Tree – Honey Tree	Existing

[#] "Environmental Assessment, Duralie Extension Project", DCPL 2010.

In terms on non-indigenous heritage, during 2003/2004 and 2008/2009 former mine workings from mining activities conducted during the 1930's were uncovered. Items considered to have historical significance such as a steam boiler, timber pit props, rail and broken pieces of coal skip wheels were provided to the Stroud Historical Society.

MANAGEMENT OF NATIVE FAUNA and FLORA

DCPL endeavour to properly manage native fauna and flora which are either impacted or have the potential to be impacted by mining operations. In keeping with this philosophy a Vegetation Clearance Protocol (VCP) was prepared which provides details on flora and fauna management strategies. Under the VCP, pre-clearance surveys and habitat assessment are undertaken in areas of native vegetation prior to disturbance.

"Habitat" trees are those trees considered to have the potential to provide shelter for arboreal animals (eg via hollows etc). Upon felling of habitat trees, any fauna recovered during the felling operation are relocated to suitable alternative habitat.

Tree clearance to the Strip 14 (Weismantel Pit) northern design boundary in addition to initial clearing within the Clareval Pit area occurred during the review period. There was limited tree removal required within both of these areas due to substantial pasture/grassland presence.

Sightings of vulnerable species are reported to the National Parks & Wildlife Service.

EMPLOYEE ENVIRONMENTAL AWARENESS TRAINING

The majority of operational employees at the Duralie Mine previously worked at the Stratford Mine. As such they were exposed to an Environmental Awareness Programme previously given to staff and employees of that site. This programme involved presentations on a series of environmental topics at "tool box talks".

Prior to the commencement of mining operations at the Duralie Mine site, plant operators were given a presentation by the Environmental Officer on issues of specific relevance to the Duralie site – with particular emphasis on water management and acid rock drainage.

Contractors and new employees working at site are also provided with information on environmental issues as part of induction training. This includes elements such as the reporting of oil or fuel spills, removal of wastes etc.

REHABILITATION

The primary objectives of the rehabilitation programme are:

- Production of a landform which is stable and consistent with the local surrounding landscape;
- Minimisation of erosion;
- Re-instatement of pre-mining land capability for the final land uses of grazing, woodland habitat and/or other appropriate land use;
- Tree and shrub establishment, mounding or bunding to provide visual amenity and to re-establish flora and fauna corridors and habitats; and
- To minimise the amount of disturbed land awaiting rehabilitation.

REHABILITATION PRINCIPLES

Rehabilitation of disturbed areas is undertaken concurrent with ongoing mining operations.

Disturbances associated with the construction of the mine infrastructure (e.g. rail siding and access road batters, office areas) have been rehabilitated using a variety of techniques including reshaping, topsoil placement, seeding/fertilising and hydramulching.

Rehabilitation of the out of pit overburden dump involves the contouring of the outer dump faces to an overall slope of 1 in 4 followed by drainage works (ie contour drains with grade 1% flattening to 0.6%).

A small proportion of the out of pit dump lies on a natural ground profile which falls away from the mining excavation. In order to limit the potential for infiltrating rain to accumulate salts and thence to charge a local waterway, a nominal 0.6m compacted clay layer was placed beneath the topsoil covering.

Topsoil, previously stripped from the site, is respread to a nominal thickness of 100mm and revegetated. Direct placement of freshly stripped topsoil on areas under rehabilitation is undertaken wherever possible.

The overburden dump is rehabilitated in progressive increments to the final landform so that contaminated water catchment areas are minimised.

Topsoil is removed from ahead of the advancing pit or overburden dump. All suitable and accessible topsoil material is removed. The topsoil is pushed into piles by dozers and loaded into trucks by

excavator. The topsoil is either immediately respread onto recontoured areas or is stockpiled for later re-use.

To minimise degradation of topsoil quality during stockpiling the following measures are in place: stockpiling time is minimised whenever possible; topsoil stockpiles do not exceed 3m in height (average 1.5m) and stockpiles are reshaped, seeded with pasture grasses and fertilised to maintain biological activity. These measures help prevent erosion, soil loss and limit dust generation.

Following drainage works and topsoil placement, site preparation involves chisel ploughing on level ground or ripping (300-400mm) on slopes.

Areas to be rehabilitated will comprise a combination of treed and pastured areas. Trees are planted to achieve maximum aesthetic and screening effects as well as providing windbreaks, woodlots, stock shelter and habitat enhancement. Local endemic native species (particularly trees identified in the EIS) will be used wherever possible based on trialing of various species in the initial rehabilitation areas. Pasture seed utilised will consist of a mix based on previous sowings, seasonal availability and external advice.

In terms of the site's topsoil balance, it is anticipated that sufficient topsoil resources will be available to complete rehabilitation. This expectation is based on topsoil to date being stripped to at least 100mm, deeper topsoil profiles lying in the Coal Shaft Creek area and a final void ultimately being produced. An estimation of stored topsoil on hand is provided below.

TOPSOIL STRIP VOLUMES AND TOPSOIL RESERVES

At the end of the reporting period an estimated 236,000 cubic metres of topsoil was held in various stockpiles.

On the basis of areas currently disturbed that will require rehabilitation in the future (estimate of 121 hectares), there is currently adequate reserves of topsoil to provide a nominal 100 to 150mm cover. However, considering the eventual presence of a final void which will not require topsoiling, a proportion of stored topsoil could be dedicated to forming deeper profiles within a re-established Coal Shaft Creek with sufficient topsoil resources remaining to ensure an adequate topsoil cover of other areas.

REHABILITATION PROGRESS

Rehabilitation has been completed in areas such as the shoulders of the site access road, western (mine water dam) cleanwater diversion drain, rail siding embankments, dam embankments and the Coal Shaft Creek diversion.

Rehabilitation completed during the current reporting was restricted to topsoil stockpiles.

Table 14 summarises the main rehabilitation works undertaken in the reporting period.

Table 14 - Summary of Main Rehabilitation Works

Rehabilitation Type	Area (ha)	Sites Treated
Sown Pasture on Topsoiled Areas	6	Eastern facing outer slope of ex pit dump.
Sown Pasture on Topsoil Stockpiles or former Stockpile Locations	2.4	Topsoil stockpiles from soil removed predominantly from the Clareval pit area and the Auxiliary Dam 2 construction site.

Completed rehabilitation is shown in figure 9 (P&A Volume).

Rehabilitation activities in the next 12 months will centre on:

- Progression of the out of pit emplacement area.

The rehabilitation target for the next review period is subject to acceptance of the Duralie Open Cut Coal Mine Mining Operations Plan (MOP) (2010) by DTIRIS. The MOP makes provision for 52.8 hectares of rehabilitated area by Year 3 operations (end 2013).

As at September 2011, vegetation establishment was as follows:

Table 15 - Summary of Revegetation Progress

AEMR/AR Year Area Sown	Location	Status
2006	eastern waste emplacement	95% ground cover (pasture area) – kikuyu and Rhodes grass dominant. Scattered acacia to 3m in height.
2007/8	southern waste emplacement	80% ground cover, acacia to 3m in height, eucalypts to 5m, (western facing). Plateau area and eastern facing side substantial ground cover – predominantly Rhodes and paspalum grass species.
2009	southern waste emplacement	70% ground cover, largely Rhodes and paspalum. Scattered acacia establishment (two species) to 2m. Occasional emerging eucalypt.
2010	eastern flank of Weismantel Pit	Planting within drains occurred towards end of reporting period.
2011	eastern waste emplacement	20% ground cover (Rhodes), eucalypt/acacia tree establishment. Tree species juvenile.

LAND USE MANAGEMENT

Agricultural Report

Cropping

Information on past cropping is contained in previous AEMR reports.

All cropping has occurred within northern/Type III irrigation areas. As a consequence of the northerly advance of the Weismantel Pit there are currently no available areas suitable for cropping.

Grazing

During the reporting period there were approximately 75 head of cattle grazing within the mining lease area on either a lease or agistment basis involving two (2) separate lessees or agisters.

Landscaping and Visual Screening

DCPL produced a Landscaping and Revegetation Management Plan (LRMP) as required under Development Consent Condition 31. DCPL also provided a Draft Rehabilitation Management Plan to the NSW Department of Planning & Infrastructure in May 2011 as required by Project Approval Schedule 3, Condition 49, which is yet to be approved.

The overall visual impacts of the Duralie Mine are generally considered low. However, some local impacts will occur and undertakings such as the following have been, and will continue to be, adopted to lessen these impacts:

- Minimising (where possible) disturbance to native vegetation, especially where such vegetation is providing visual screening;
- Retention specifically of ridge Open Forest and regrowth forest (where possible);
- Retention of all riparian vegetation along Mammy Johnsons River and those out of pit sections of Coal Shaft Creek;
- Ensuring out of pit emplacement design produces a landform which integrates with the adjoining natural landform;
- Painting of substantial fabricated infrastructure with a colour ("Rivergum") that assists it to blend in with the adjoining landscape;
- Maintenance of infrastructure to retain the ability of such infrastructure to blend into the surrounding landscape over the life of the project; and
- Placement, configuration and direction of lighting to reduce offsite nuisance effects of stray light.

Weed Control

Weed spraying to control wild cotton, wild tobacco, thistles, blackberry and acacia in various areas such as along the site access road, on the Mine Water Dam outer embankment, within the Type II & III irrigation areas, adjacent to the Mine Water Dam diversion drain, Tombstone area and other areas within the mining lease has been undertaken in previous reporting periods. There was no weed spraying undertaken during the current review period.

Feral Animal Control

Feral animals have not been a significant problem on site to date and hence no control practices have been required.

Bush Fire Management

DCPL does not have a formal Bushfire Management Plan specific to the site in place. However, the following bushfire management related activities/works include:

- Improved access to sections of the DCPL landholdings has been created with the construction of the mine;
- LM can make available an off road water cart for bushfire fighting purposes where suitable access for this machinery is available;
- DCPL routinely (as required) undertakes hazard reduction burns, in consultation with

neighbouring property owners/occupiers and the local Rural Fire Service unit. No such burns were required during the reporting period; and

- Fuel loads on cleared pastures area on the mine site which are removed from mining operations and adequately fenced are reduced by cattle agistment and/or periodic slashing.

Final Void Treatment

Under the current Project Approval, a final void will be produced at the northern limit of the mining lease area. This will follow completion of surface mining.

It is anticipated that issues associated with the final void will be addressed as part of mine closure planning.

COAL TRANSPORTATION

A run of mine (ROM) Coal Transportation Management Plan (CTMP) was prepared for the project. The CTMP details procedures for the monitoring of potential environmental impacts resulting from the storage and subsequent transportation of ROM coal by rail to the Stratford Coal Mine for processing.

QUALITY IMPROVEMENT AND TARGET INITIATIVES

ENVIRONMENTAL MANAGEMENT

The following environmental targets have been set for the next 12 months:

- Minimise noise related complaints reported to the mine; and
- Progress rehabilitation works to satisfy MOP nominated targets.

REHABILITATION

A rehabilitation target of 52.8 hectares by end 2013.

LIST OF PLANS (Appendix Volume)

LIST OF APPENDICES (Appendix Volume)

I. Amended or New Approval and Licence Conditions issued during the Reporting Period

II. Environmental Monitoring Data

III. Weather Data (EPA only)

IV. Annual Rehabilitation Report Form (DPI-Minerals only)