PROJECT DESCRIPTION AND PRELIMINARY ASSESSMENT

DURALIE EXTENSION PROJECT

October 2009

DURALIE COAL

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DURALIE
COAL

OCTOBER 2009
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1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

Duralie Coal Pty Ltd (DCPL) is seeking approval from the Minister for Planning for a Project Approval under Part 3A of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) for the proposed Duralie Extension Project (the Project).

This document has been prepared in accordance with Part 3A of the EP&A Act and the *Environmental Planning and Assessment Regulation, 2000* (EP&A Regulation). The EP&A Act and EP&A Regulation set the framework for planning and environmental impact assessment in New South Wales (NSW). Part 3A of the EP&A Act provides an approval process for projects deemed by the Minister for Planning to be Major Projects.

In accordance with the Draft Major Project Guideline (*Steps in the Assessment and Approval of Major Projects under Part 3A,* NSW Department of Infrastructure, Planning and Natural Resources [DIPNR], 2005a), this document provides the information outlined in Table 1.

Table 1
Draft Major Project Guideline Requirements – Reference Summary

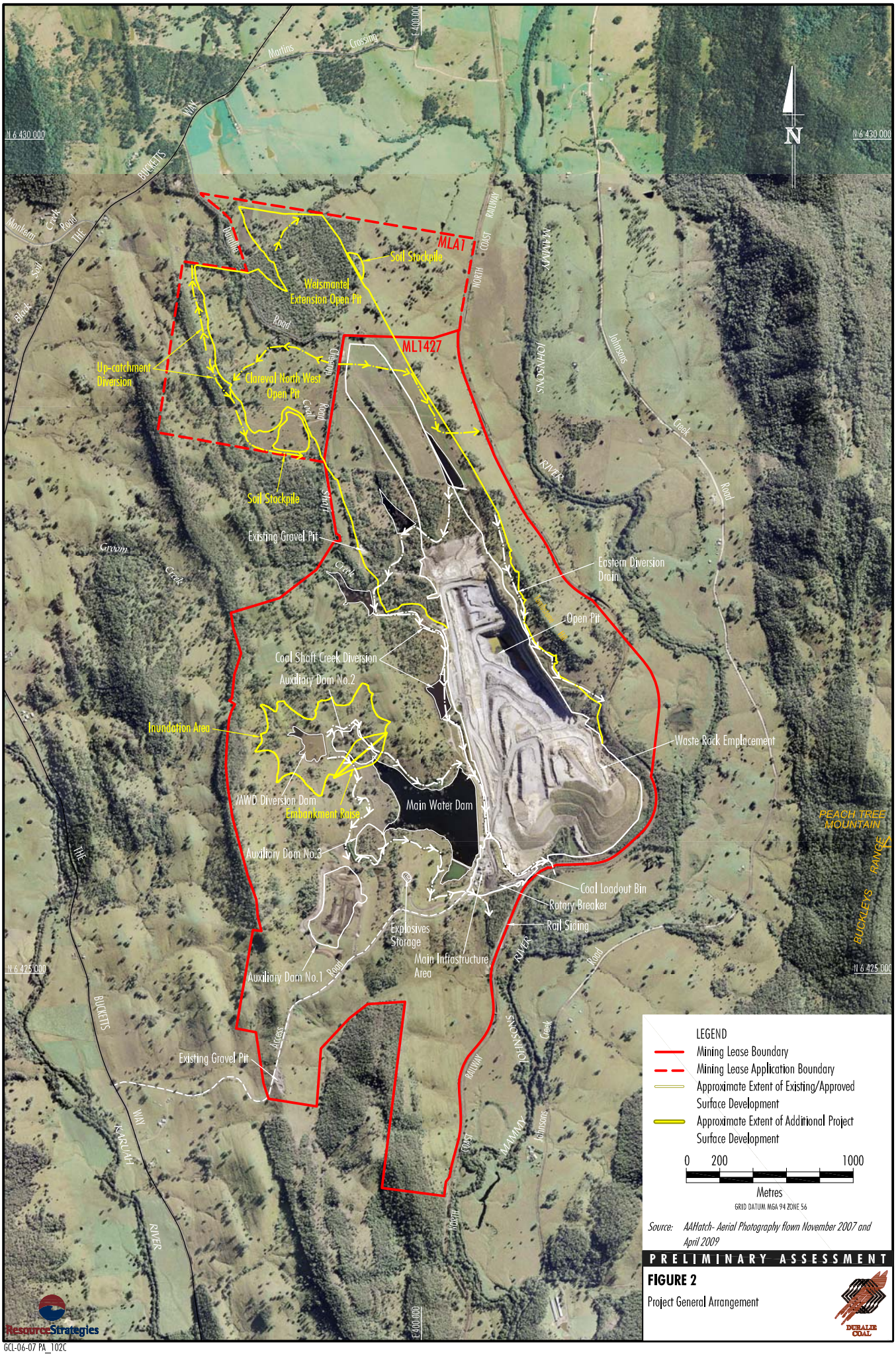
Draft Major Project Guideline Requirement*	Preliminary Assessment Reference
Information to confirm that the project is a project to which Part 3A of the EP&A Act applies.	Sections 1 to 3
Information to confirm whether a Concept Plan will be required or authorised by the Minister.	Section 3
A description of the project and any ancillary components.	Section 2
The location and a map identifying the site.	Figures 1 and 2
The capital investment value and other relevant information in relation to parameters set out in the *State Environmental Planning Policy (Major Projects), 2005* (Major Projects SEPP) for determining whether Part 3A applies to the Project.	Section 2.9
The planning provisions applying to the site.	Section 3
The views of other agencies, local council or the community if known.	Section 4
Any other approvals required. In particular, if a licence from the NSW Department of Environment and Climate Change (DECC) is required under the *Protection of the Environment Operations Act, 1997* (PoEO Act).	Section 3
Justification as to why the project should be considered to be a major project under Part 3A of the EP&A Act, taking into consideration the relevant criteria.	Section 3
Preliminary environmental assessment and identification of likely environmental issues.	Section 5

* Adapted from DIPNR (2005a).

The Preliminary Assessment (Section 5) identifies key environmental assessment issues of particular relevance to the Project, and provides the following for each issue, where relevant:

- a preliminary description of the existing environment;
- an analysis of the likely extent and nature of potential impacts; and
- identification of the level and scope of environmental impact assessment to be undertaken for the Environmental Assessment (EA).

GCL-06-07 PA_101A


N 6 430 000
N 6 425 000
E 400 000
N
MLAT 1
ML1427
Soil Stockpile
Weismantel Extension Open Pit
Up-catchment Diversion
Clareval North West Open Pit
Soil Stockpile
Existing Gravel Pit
Eastern Diversion Drain
Open Pit
Coal Shaft Creek Diversion
Auxiliary Dam No.2
Inundation Area
Waste Rock Emplacement
MWD Diversion Dam Embankment Raise
Main Water Dam
Auxiliary Dam No.3
Coal Loadout Bin
Rotary Breaker
Rail Siding
Explosives Storage
Main Infrastructure Area
Auxiliary Dam No.1
Existing Gravel Pit
Martins Crossing
Monkerai Road
Black Soil
Groom Creek
Coal Road
Johnsons Creek
Access Road
Buckets Way
Karuah River
Johnsons Creek
Peach Tree Mountain
Buckleys Range
LEGEND
Mining Lease Boundary
Mining Lease Application Boundary
Approximate Extent of Existing/Approved Surface Development
Approximate Extent of Additional Project Surface Development
0 200 1000
Metres
GRID DATUM: MGA 94 ZONE 56
Source: AAHatch- Aerial Photography flown November 2007 and April 2009
PRELIMINARY ASSESSMENT
FIGURE 2
Project General Arrangement
ResourceStrategies
DUNDALEE COAL
GCL-06-07 PA_102C

The assessment has been undertaken generally in accordance with the draft *Guideline: What is the Level and Scope of Assessment for Major Projects? Preliminary Assessment* (the Draft Preliminary Assessment Guideline) (DIPNR, 2005b).

1.2 BACKGROUND

The Duralie Coal Mine (DCM) has been operating since 2003 and is owned and operated by DCPL, a subsidiary of Gloucester Coal Ltd (GCL). The DCM is situated approximately 10 kilometres (km) north of the village of Stroud and approximately 20 km south of Stratford in the Gloucester Valley in NSW (Figure 1).

Another GCL subsidiary, Stratford Coal Pty Ltd (SCPL), owns and operates the Stratford Coal Mine (SCM), which is located some 20 km to the north. The run-of-mine (ROM) coal produced at the DCM is railed to SCM, where it is unloaded and processed.

1.2.1 Duralie Coal Mine Approvals History

The potential environmental impacts associated with the development of the DCM were assessed in the *Duralie Coal Environmental Impact Statement* (the Duralie Coal EIS) (DCPL, 1996). The original Duralie Coal Project included an open cut mine, rail loop, Coal Handling and Preparation Plant (CHPP) and associated facilities. Following a Commission of Inquiry, the NSW Minister for Urban Affairs and Planning granted Development Consent for the mine in August 1997.

In 1998, prior to the development of the DCM, a new Development Application was lodged with the NSW Department of Urban Affairs and Planning (DUAP) to allow DCM ROM coal to be railed to the SCM for washing in the Stratford CHPP. This allowed reduction in the area required for the rail siding and negated the requirement to build a CHPP complex at the DCM. At this time the Project was also altered by reducing the area to be mined and the rate of coal production. The environmental implications of the modification were assessed via the *Proposed Alterations to Duralie Coal Project Statement of Environmental Effects* (Duralie SEE) (DCPL, 1998). Alterations to Stratford operational activities were also proposed to allow the acceptance of Duralie ROM coal and were assessed via the *Proposed Modifications to Stratford Coal Mine Statement of Environmental Effects* (SCPL, 1998). The alterations to the two Projects were approved in February 1999 by the Minister for Urban Affairs and Planning and new Development Consents were issued for both the DCM and the SCM at this time. Coal production at the DCM commenced in 2003.

In early 2003, a modification to the DCM was lodged in regard to an amendment to the DCM water management system (i.e. the Coal Shaft Creek Diversion). In August 2003, a secondary modification to the DCM was lodged with the DoP that sought to revise the alterations made in the earlier 2003 modification regarding the diversion. Both modifications (MOD-13-3-2003-i and MOD-92-9-2003-i) were approved by the Minister for Planning in 2003.

In early 2006, a modification to the DCM was lodged with the NSW Department of Planning (DoP), which involved an extension of the DCM open cut and waste rock emplacement and an associated increase in the annual ROM coal production rate from 1.5 million tonnes per annum (Mtpa) up to 1.8 Mtpa. The environmental implications of the modification were assessed via the *Duralie Extended Modification Statement of Environmental Effects* (Duralie Extended SEE) (DCPL, 2006). Duralie Extended (DA 168/99 MOD 3) was approved by the Minister for Planning in July 2006.

In late 2008, a modification was also lodged with the DoP that involved construction of auxiliary water storage dams. The modification (DA 168/99 MOD 4) was approved by the Minister for Planning in December 2008.

In June 2009, a modification to the DCM was lodged with the DoP, which involved an extension of the DCM open cut and waste rock emplacement. The environmental implications of the modification (DA 168/99 MOD 6) were assessed via the *Duralie June 2009 Modification Environmental Assessment* (DCPL, 2009). Approval for the modification is being sought under section 75W of the EP&A Act. Determination of the modification by the Minister for Planning is expected in October 2009.

1.2.2 Existing Duralie Coal Mine

The DCM is a typical open pit coal mining operation using conventional hydraulic excavator and haul truck fleets. The DCM currently produces up to 1.8 Mtpa of ROM coal and operates 24 hours per day. The ROM coal is initially sized at the DCM prior to being transported by rail to the SCM CHPP.

ROM coal is loaded onto a dedicated train that runs between the two mines on the North Coast Railway. At the SCM, the coal is unloaded and processed in the CHPP. Blended product coal produced at the SCM is transported off-site by rail (primarily to the Port of Newcastle for export).

Mining Operations

The general sequence of mining is as follows:

- topsoil stripping and stockpiling;
- removal of weathered and weak overburden by excavator;
- drilling and blasting of overburden;
- removal of general non-acid forming (NAF) overburden and trucking to the waste rock emplacement;
- selective mining of potentially acid forming (PAF) overburden for placement with limestone within the waste rock emplacement;
- selective mining of coal and haulage to the ROM pad and DCM coal handling plant area (including a rotary breaker); and
- progressive backfilling of the open pit with mined waste rock, prior to profiling and progressive rehabilitation.

PAF material is managed in accordance with the PAF Material Management Plan (DCPL, 2003).

ROM coal is loaded by excavator into haul trucks from the open pit and transported to the coal handling area (including a rotary breaker), at the main infrastructure area. The bulk of the ROM coal is tipped directly into a dump hopper. ROM coal is also stored for short periods on the ROM pad. Sized ROM coal from the rotary breaker is transferred by conveyor to the 2,250 tonne (t) coal loadout bin for loading into train wagons.

Coal Rail Loading and Transport

Rail loading and transport services are provided by a rail contractor who supplies a dedicated train service and co-ordinates all loading, unloading and train movements with the Australian Rail Track Corporation (ARTC) in accordance with DA 168/99. Rail transportation of coal from the DCM to SCM is currently confined to the hours between 7.00 am and 10.00 pm.

SCM Coal Handling, Product Coal Loading and Coal Reject Disposal

Coal from the DCM is unloaded at the SCM and conveyed to the ROM coal stockpile area for processing and blending. Coal reject material from the CHPP is emplaced at the SCM main pit. These activities and the railing off-site of coal products are undertaken under the separate SCM Development Consent (DA 23-98/99).

Water Management

The DCM site water management includes the following key components:

- water management storages;
- diversion of runoff from catchment areas upstream of the mine disturbance area;
- runoff control on disturbed and rehabilitated areas at the mine;
- runoff control on infrastructure areas;
- sedimentation control;
- open pit dewatering;
- disposal of excess water through on-site agricultural irrigation; and
- sewage treatment and disposal of effluent.

A key component of the DCM water management system is the Coal Shaft Creek Diversion (Figure 2). Prior to the commencement of mining, Coal Shaft Creek traversed the Duralie deposit. The staged construction of the Coal Shaft Creek diversion has allowed the mine to be developed.

Water collected for storage on-site includes groundwater inflows into the open pit mine and incident rainfall in the open pit. Water pumped from sumps in the open pit is stored in the Main Water Dam (MWD). The MWD is located to the north-west of the main infrastructure area (Figure 2) and has a capacity of approximately 1,405 megalitres (ML). Water management infrastructure at the DCM also includes the approved auxiliary dams No. 1, No. 2 and No. 3.

The water balance at the DCM is generally in surplus. Excess water is used for dust suppression and for controlled irrigation for agricultural enterprises in accordance with the approved Irrigation Management Plan (DCPL, 2008).

General Infrastructure

The following summarises the supporting infrastructure and mine-related facilities at the DCM:

- Site access is via the 3 km sealed all weather access road off The Bucketts Way (Figure 2).
- The rail siding (which includes a rail siding off the North Coast Railway, coal load-out bin and associated conveyor systems) provides for the rail transport of DCM ROM coal to the SCM.
- The electricity supply and distribution system is fed by an 11 kilovolt (kV) distributor line which runs along The Bucketts Way and a spur off this line which supplies the DCM site. A private substation (owned by DCM) provides an 11 kV/415V supply which is reticulated around the site at variable voltages according to requirements.
- Supporting buildings and facilities include the administration, workshop, stores and ablution buildings along with heavy vehicle servicing, parking and washdown facilities.
- Extensive water supply and water management infrastructure is located on-site including water management dams (Figure 2), sewage treatment facilities and agricultural irrigation systems.

- A diesel storage tank (110,000 litre [L] capacity) is operated in accordance with the requirements of Australian Standard (AS) 1940: The Storage and Handling of Flammable and Combustible Liquids.

Environmental Management

Environmental management at the DCM is undertaken in accordance with the Development Consent (DA 168/99) and a range of environmental management plans, procedures and environmental monitoring programmes. Current DCM environmental management plans, procedures and monitoring programmes can be downloaded from the GCL website:

http://www.gloucestercoal.com.au/environment-dcm.php

The current DCM environmental plans and programmes include:

- Environmental Management Strategy (DCPL, 2007a).
- Environmental Monitoring Program (DCPL, 2008b).
- Noise Monitoring Program (DCPL, 2007b).
- Blast Monitoring Programme (DCPL, 2007c).
- Air Quality Monitoring Program (DCPL, 2007d).
- Site Water Management Plan (DCPL, 2008b), incorporating:
  - Site Water Balance;
  - Erosion and Sediment Control Plan;
  - Surface Water Management and Monitoring Plan;
  - Groundwater Monitoring Program; and
  - Surface and Groundwater Response Plan.
- Irrigation Management Plan (DCPL, 2008a).
- Rehabilitation Management Plan (DCPL, 2007e), incorporating:
  - PAF Material Management Plan;
  - Vegetation Clearance Protocol (VCP);
  - Topsoil Stripping Management Plan; and
  - Aboriginal Heritage Management Protocol.

1.2.3 Project Integration

The Project would enable the continuation of open pit coal mining operations at the DCM. The area of proposed open pit mining is situated to the north and west of the approved DCM mining area (Figure 2). The Project would extend the life of the DCM by approximately nine years. Existing facilities at the DCM (e.g. administration, workshops, coal handling, rail loading and service infrastructure) would be used to service the Project, however, some additional mobile equipment and minor infrastructure would be required.

A summary description of existing and new/modified infrastructure and mining is provided in Section 2.

DCPL is seeking Project Approval from the Minister for Planning under Part 3A of the EP&A Act for the Project. It is anticipated that the Project Approval would, where appropriate, replace existing approvals for the DCM.

1.2.4 Part 3A Project Steps Already Undertaken

A Project Application and Preliminary Environmental Assessment was lodged for the Project in October 2008. Detailed water management and mine planning feasibility studies conducted during 2009 have resulted in the following changes to the Project:

- removal of irrigation areas to the east of Mammy Johnsons River;
- removal of controlled mine water discharge to the Mammy Johnsons River;
- inclusion of approximately 2,631 ML of additional on-site water storage capacity by raising the auxiliary dam No. 2 embankment (i.e. the total storage capacity of auxiliary dam No.2 would be increased from 169 ML to approximately 2,800 ML); and
- removal of the Clareval West open pit from the proposed open cut mining operations.

DCPL has prepared this revised Project Description and Preliminary Environmental Assessment to reflect the above revised Project description and to support an amendment to the Project Application. The amendment seeks a reduction in the Project application area and omission of previously proposed Project components principally as a result of the proposed introduction of additional water storage within the existing Mining Lease (ML) 1427.

A number of milestones under Part 3A of the EP&A Act have already been met for the Project Application, including:

- A Planning Focus Meeting was held in November 2008.
- The Director-General of the DoP, under delegation from the Minister for Planning, declared the Project to be a “Major Project” under the Major Projects SEPP on 27 October 2008.
- Director General’s Environmental Assessment Requirements (EARs) were issued by the DoP in December 2008.

2 PROJECT DESCRIPTION

2.1 LOCATION AND MINING TENEMENTS

The existing DCM operations are undertaken within ML 1427 (Figure 2). GCL holds coal exploration tenements (exploration authorisation 315 [A315], A311 and EL6904) that extend from the DCM to the SCM. The Project extensions to the DCM would involve mining extensions to the west and north-west within ML 1427 (Figure 2) and A315, and development of new agricultural irrigation areas. DCPL would lodge a Mining Lease Application (MLA) with the NSW Department of Industry and Investment - Mineral Resources (DII-MR) for mining activities that would extend outside of ML 1427 (i.e. MLA 1) (Figure 2).

2.2 PROPONENT

The proponent for the Project is DCPL (ABN 81 070 318 259), a wholly owned subsidiary of GCL.

The registered office of GCL is:

Level 15, Citadel Towers (Tower B)
799 Pacific Highway
CHATSWOOD NSW 2067

Further information on the proponent and its coal mining operations can be found at:

http://www.gloucestercoal.com.au/index.html

2.3 PROJECT SUMMARY

The main activities associated with development of the Project would include:

- continued development of open cut mining operations at the DCM to facilitate a total ROM coal production rate of up to approximately 3 Mtpa, including:
  - extension of the existing approved open pit in the Weismantel Seam to the north-west (i.e. Weismantel Extension open pit) within ML 1427 and MLA 1; and
  - open cut mining operations in the Clareval Seam (i.e. Clareval North West open pit) within ML 1427 and MLA 1;
- ongoing exploration activities within existing exploration tenements;
- progressive backfilling of the open pits with waste rock as mining develops, and continued and expanded placement of waste rock in out-of-pit waste rock emplacements;
- increased ROM coal rail transport movements on the North Coast Railway between the DCM and SCM in line with increased ROM coal production;
- continued disposal of excess water through agricultural irrigation (including development of new irrigation areas within the existing ML 1427 and the proposed MLA 1);
- raising of the existing approved auxiliary dam No.2 embankment from relative level (RL) 81m to approximately RL 100m to provide significant additional on-site storage capacity to manage excess water on-site;
- progressive development of dewatering bores, pumps, dams, irrigation infrastructure and other water management equipment and structures;
- development of new haul roads and internal roads;

- upgrade of existing surface facilities and supporting infrastructure as required in line with increased ROM coal production;
- continued development of soil stockpiles, laydown areas and gravel/borrow pits;
- establishment of permanent Coal Shaft Creek alignment adjacent to the existing DCM mining area;
- ongoing surface monitoring and rehabilitation; and
- other associated minor infrastructure, plant, equipment and activities.

Table 2 provides an overview of the existing DCM and the proposed Project.

Table 2
Project Overview

Project Component	Summary of the Existing DCM	Summary of the Project
Open Cut Mining and ROM Coal Production	• Conventional open cut mining methods and equipment. • ROM coal production of approximately 12.3 million tonnes (Mt).	• Conventional open cut mining methods and equipment. • ROM coal production of up to approximately an additional 20.5 Mt. The total resultant life of mine ROM coal production since the commencement of DCM open pit operations would be approximately 32.8 Mt.
Life of Mine	• Scheduled cessation of mining in 2010.	• Current mine planning indicates an additional operational life of at least nine years.
Coal Seam/Pits	• Mining of the Weismantel Seam (Weismantel open pit).	• Mining of the Weismantel Seam by extending the existing open pit (Weismantel Extension open pit). • Mining of the Clareval Seam (Clareval North West open pit).
ROM Coal	• Production of approximately 1.8 Mtpa of ROM coal.	• Production of up to approximately 3 Mtpa.
Waste Rock Management (Backfill)	• Backfill within Weismantel open pit. • Maximum elevation of backfilled waste rock emplacement approximately RL 110 metres (m).	• Continued backfill within Weismantel and Weismantel Extension open pits and additional backfill within Clareval North West open pit. • Maximum elevation backfilled waste rock emplacement approximately RL 110 m.
Life of Mine Waste Rock	• Approximately 40 million bank cubic metres (Mbcm).	• Approximately 114 Mbcm of additional waste rock. The resultant total of life of mine waste rock since the commencement of DCM open pit operations would be approximately 154 Mbcm.
ROM Coal Train Movement Hours	• 7.00 am to 10.00 pm.	• 7.00 am to 2.00 am.
Water Management	• Water management system comprises of water management storages, runoff diversions and control, sediment control, open pit dewatering and sewage treatment. • Disposal of excess water through on-site agricultural irrigation within ML 1427. • Water management system designed for no release of water to Mammy Johnsons River.	• Progressive upgrades and augmentation to existing water management system, including raising of embankment of auxiliary dam No. 2 from RL 81m to approximately RL 100 m and utilisation of the Weismantel Extension open pit void as in-pit water storage. • Development of new irrigation areas within ML 1427 and MLA 1. • Water management system designed for no release of water to Mammy Johnsons River.

Table 2 (Continued)
Project Overview

Project Component	Summary of the Existing DCM	Summary of the Project
Coal Handling	• Coal handling area (including rotary breaker).	• Coal handling area (including rotary breaker).
Final Voids	• At the cessation of mining, the final void would remain in the Weismantel open pit.	• At the cessation of the Project, final voids would remain in the Clareval North West open pit and Weismantel Extension open pit.
Rehabilitation	• Rehabilitation of waste rock emplacement areas and other progressive surface disturbance areas.	• Continued rehabilitation of waste rock emplacement areas and other progressive surface disturbance areas.
Exploration	• Exploration activities undertaken ahead of the open cut mining operations to investigate geological structures and seam morphology as input to detailed mine planning.	• Exploration activities would continue to be undertaken in accordance with the requirements of existing exploration tenements.
Employment	• The existing number of operational employees is approximately 120 employees.	• It is anticipated that an average of approximately 135 employees would be required during operation of the Project.

Further details on key aspects of the Project are provided below.

2.4 MINING OPERATIONS

As described in Table 2, extension of open pit mining at the DCM would include two primary extensions to the approved operation (Figure 2):

- a northern extension to the current Weismantel open pit workings (Weismantel Extension open pit); and
- an open pit sub-parallel to the Weismantel Extension to mine the adjacent Clareval Coal Seam (Clareval North West open pit).

Each of the additional open pits would also involve general supporting infrastructure such as soil stockpiles, hardstands, haul roads and water management structures.

Provisional design of the additional open pit development areas indicates:

- the Weismantel Extension open pit would be approximately 1 km further along the strike[1] to the north and up to 400 m wide; and
- the Clareval North-West open pit would be approximately 2 km long and 600 m wide.

As a component of the extension and increased capacity of mining operations, additional mining fleet items would be required.

[1] In the same direction as the geological formation.

Waste Rock Emplacement

Up to approximately 114 Mbcm of additional waste rock would be produced by the Project open pit mining operations. The Project would result in an extension of the existing DCM waste rock emplacement to the north-west. No change is proposed to the maximum height of the backfilled waste rock emplacement (i.e. RL 110 m).

It is anticipated that the existing DCM PAF waste rock management methodologies would be suitable for the Project. Notwithstanding, a geochemical assessment would be conducted as part of the EA and would be used to evaluate the characteristics of overburden materials and the suitability of existing management measures (Section 5.3.9).

Final Voids

It is anticipated that final voids would remain in the Clareval North West open pit and Weismantel Extension open pit at the cessation of mining. Final void design and water management assessment would be an integral component of the surface water assessment for the Project (Section 5.3.2).

2.5 ROM COAL TRANSPORT

In order to facilitate the increase in ROM coal production, the total capacity of ROM coal train wagons would be increased from approximately 2,000 t up to approximately 2,500 t per rail movement.

In addition, it is expected that the number of train movements would increase from approximately three movements per day to approximately four movements per day when averaged over a year.

In order to facilitate improved access to the rail network train paths and accommodate the additional train movements, the train movement hours would also be extended (Table 2).

The existing train loading infrastructure at the DCM and train unloading infrastructure at the SCM is suitable to accommodate the additional Project train movements and hence no modifications to these facilities are required.

2.6 WATER MANAGEMENT

The existing water management system would be progressively augmented as water management requirements change over the life of the Project. In particular, the embankment of auxiliary dam No. 2 would be raised from RL 81m to approximately RL 100 m to provide significant additional capacity for the storage and management of water on-site. Additional irrigation areas would also be developed within MLA 1 and ML 1427 to provide for the beneficial utilisation of excess water from the mining operations.

2.7 GENERAL INFRASTRUCTURE

The general arrangement of the Project has been designed to maximise the use of existing infrastructure at the DCM, with minor additions, upgrades and maintenance works undertaken as required.

2.8 ROAD TRAFFIC

The existing access road off The Bucketts Way would remain the primary site access (Figure 2).

The entire length of Cheerup Road and approximately 1 km of Durallie Road (within MLA 1) would be closed to the public for the duration of the Project (Figure 2).

2.9 CAPITAL INVESTMENT VALUE

The capital investment value for the Project is estimated to be approximately $55 million, primarily associated with new and replacement mobile equipment.

2.10 WORKFORCE

At full development the Project would employ in the order of 135 people. This would include direct GCL employees and on-site contractors. The Project would provide for the continued employment and expansion of the DCM workforce for a period of approximately nine years.

3 PLANNING PROVISIONS AND PROJECT APPROVAL CONSIDERATIONS

Environmental Planning and Assessment Act, 1979

Approval for the Project would be sought under Part 3A of the EP&A Act. The Project was declared to be a Major Project in October 2008.

Project Approval would be sought from the Minister for Planning.

Commonwealth Environment Protection and Biodiversity Conservation Act, 1999

The Project would be referred to the Commonwealth Minister for the Environment, Heritage and the Arts for consideration as to whether it is considered to be a controlled action and requires approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act).

Local Environmental Plan

The DCM and the Project extensions are located wholly within the Great Lakes Local Government Area (LGA). The DCM and the Project extensions are situated on land zoned 1a (Rural Zone) in the *Great Lakes Local Environmental Plan* (Great Lakes LEP), *1996*.

The requirements of the Great Lakes LEP would be considered in the preparation of the Project EA where relevant.

Protection of the Environment Operations Act, 1997

The PoEO Act and the *Protection of the Environment Operations Regulations, 1997* set out the general obligations of environmental protection for development in NSW.

The DCM currently operates under Environment Protection Licence (EPL) No. 11701 issued by the DECC under the PoEO Act. The EPL addresses aspects such as emission limits, environmental monitoring and reporting. It is expected that the Project would, if approved, necessitate a revision of the EPL.

4 STAKEHOLDER CONSULTATION

Consultation with NSW government agencies in relation to the Project commenced in 2006. Consultation with local community members and other stakeholders regarding the proposal commenced in 2007. It should be noted that during initial consultation, some aspects of the Project were contemplated that are no longer proposed (such as controlled mine water discharge).

A Planning Focus Meeting for the Project was held in November 2008 to provide regulators with an understanding of the Project and key assessment issues.

The meeting was attended by representatives from each of the following government agencies:

- DoP;
- NSW Department of Environment, Climate Change and Water (DECCW) (formerly the DECC and Department of Energy and Water);
- DII-MR (formerly the NSW Department of Primary Industries [DPI] – Mineral Resources);
- Great Lakes Council (GLC); and
- Gloucester Shire Council (GSC).

DCPL has made a number of presentations to the DCM Community Consultative Committees (CCC) and has also distributed Project newsletters to the community via the CCC and the GCL website. GCL has also commenced direct consultation with a number of nearby landholders, and has made various press and Australian Stock Exchange releases with respect to future expansion plans and exploration results.

A stakeholder consultation programme has been developed for the Project and would continue to be implemented during the preparation of the EA. The programme would include the use of a variety of consultation mechanisms, including:

- public exhibition of key documents (e.g. Project Application and EA);
- continued consultation via the DCM CCC;
- provision of information regarding the Project on the GCL website;
- meetings with public authorities; and
- meetings with directly affected landholders.

5 PRELIMINARY ASSESSMENT

5.1 OVERVIEW

The following Preliminary Assessment has been prepared to identify the potential environmental issues associated with the development, operation and closure of the Project. This information has been prepared for the DoP's consideration when developing the EA requirements for the Project under section 75F(2) of the EP&A Act.

The following is provided for each of the issues identified:

- a summary description of the existing environment, where appropriate;
- an analysis of the likely extent and nature of potential impacts; and
- description of the proposed level and scope of assessment proposed for the EA.

The assessment has been generally undertaken in accordance with the Draft Preliminary Assessment Guideline (DIPNR, 2005b).

In undertaking this preliminary assessment, DCPL has drawn on:

- experience from key environmental management and impact assessment issues at the DCM;
- feedback from stakeholder consultation to date; and
- the outcomes of the Preliminary Assessment Workshop (Section 5.2).

5.2 PRELIMINARY ASSESSMENT WORKSHOP

In order to identify key environmental issues of relevance to the Project, a Preliminary Assessment Workshop was conducted at DCPL offices at DCM on 3 September 2008. The workshop was undertaken in general accordance with the draft Preliminary Assessment Guideline (DIPNR, 2005b). The Preliminary Assessment Workshop participants included DCPL environmental and Project development personnel and specialist consultants (flora/fauna, hydrology and noise).

The workshop involved the following steps:

- **Identification of Potential Issues** - Consideration of how the Project is likely to affect the physical or biological aspects of the environment; natural or community resources; environmentally sensitive areas; areas allocated for conservation purposes; and areas sensitive because of community factors.
- **Identification of Key Potential Environmental Issues** - From the potential issues above, what are the key issues, considering the extent of the potential impacts; the nature of the potential impacts; and the potential impacts on environmentally sensitive areas.
- **Preliminary Consideration of the Study Requirements** - Each of the key potential environmental issues identified above were considered with respect to the level and scope of assessment that would be required for the Project EA.

The following key potential environmental issues were identified at the Preliminary Assessment Workshop and are considered relevant to the revised Project considering the extent and nature of potential impacts and the sensitivity of the site:

- management of water and potential impacts on downstream water quality and flows;
- management of waste rock (overburden) and potential impacts on water quality;
- management of potential long-term water quality effects;
- potential noise impacts on the surrounding community including operational mine and ROM coal transportation (rail) noise;
- potential air quality impacts on the surrounding community;
- potential impacts on flora and fauna habitat through clearance of regrowth areas;
- potential impacts on the rail network (capacity/scheduling);
- continued operation of the DCM and continuing DCPL regional socio-economic contributions;
- potential impacts on visual amenity; and
- potential loss of agricultural land.

Potential impacts on aquatic habitats associated with controlled mine water release was identified as a key issue at the time of the Preliminary Assessment Workshop. Controlled mine water discharge to the Mammy Johnsons River is no longer a component of the Project (Section 1.2.4).

An environmental risk analysis would be undertaken during the preparation of the EA.

5.3 ISSUE ANALYSIS

5.3.1 Land Resources

Existing Environment

Landuse

The Project is located in a rural area characterised by cattle grazing on native and improved pastures, along with some poultry farming and other agricultural production. The majority of the Project area has been cleared as part of past landuse practices.

The DCM and the SCM are the main mining developments in the immediate Project area. However a number of other mining related developments including coal seam methane and mineral exploration and development activities are known in the Gloucester region.

The eastern part of ML 1427 is currently subject to mining development, while the remainder of the ML is managed for agricultural production, including controlled use of mine water for irrigation in accordance with the approved Irrigation Management Plan (DCPL, 2008a). Landuse within MLA 1 is currently characterised by agricultural production (grazing) with some areas of regrowth vegetation (Figure 2).

DCPL owns the land within ML 1427 as well as a significant area of surrounding lands including the proposed MLA and lands to the east of ML 1427 between the mine and the vegetated ridgeline to the east.

Soils

Soil assessments conducted for the Duralie Coal EIS (DCPL, 1996) identified the following soil types in ML 1427:

- Yellow, Red and regular Podzolic Soils;
- Chocolate, Non-calcic Brown, and Prairie Soil;
- Black and Red Earth;
- Brown and Structured Plastic Clay;
- Euchrozem; and
- Alluvial Soil.

In accordance with existing management practices (e.g. the Rehabilitation Management Plan [DCPL, 2007e]), where soil resources are suitable for use in rehabilitation, soils are stripped and directly placed on areas where progressive rehabilitation is being undertaken, or stockpiled for later use.

Agricultural Suitability and Rural Land Capability

Agricultural suitability and rural land capability assessments were conducted for the Duralie Coal EIS (DCPL, 1996). Agricultural suitability assessments were conducted in accordance with the five class system (Riddler, 1996) which allows for assessment and identification of land based on suitability for agricultural purposes. Agricultural suitability in ML 1427 was assessed as Class 4 – *land suitable for grazing but not cultivation* (DCPL, 1996).

Rural land capability was assessed within ML 1427 in accordance with the standard NSW eight class system (Emery, 1985). The eight class system is based on assessment of biophysical features and categorises the land in terms of general limitations such as erosion hazard, climate and slope. Rural land capability in ML 1427 was assessed as (DCPL, 1996):

- Class IV – *not suitable for regular cultivation, may be cultivated for occasional crop or for pasture renewal*;
- Class VI – *grazing lands only, grazing management important to prevent erosion, may be saline;* and
- Class VII – *land with high erosion hazard due to steep slope, land best maintained as green timber*.

Additional mapping available from the DECC (undated) since 1996 also includes Class V lands (suitable for grazing with occasional cultivation) within ML 1427.

The irrigation of lands for agricultural production is managed in accordance with the approved Irrigation Management Plan (DCPL, 2008a).

Likely Extent and Nature of Potential Impacts

Potential impacts on land resources include:

- modification of the existing landscape and topography due to the development and extension of open pits, construction of waste rock emplacements and extension of supporting water management infrastructure;

- stripping of *in-situ* soil resources within mining disturbance areas;
- potential soil contamination from accidental spillage of fuels, lubricants and other chemicals;
- increased potential erosion and sediment movement due to increased exposure of soils during mining and the construction of mine infrastructure (e.g. water management structures);
- alteration of physical and chemical soil properties (e.g. structure, fertility, microbial activity) during soil stripping and stockpiling operations;
- expansion of the use of irrigation for contained water disposal and agricultural production and associated potential alteration of soil chemistry; and
- modifications to current landuse associated with the Project extensions.

Proposed Level and Scope of Assessment

Existing soil, agricultural suitability and land capability mapping at Duralie would be extended as necessary to address the Project development areas (Figure 2).

Erosion and sediment control measures and management measures for the stripping, stockpiling and use of soils in rehabilitation would be described in the Project EA.

Irrigation management, monitoring and management of irrigated soils in the Project irrigation areas would be incorporated in the surface water assessment (Section 5.3.2) and consideration of potential impacts on land resources, where relevant.

Progressive rehabilitation and mine closure strategies and their integration with the existing plans for the approved DCM would also be described in the EA. Further details regarding rehabilitation concepts are provided in Section 5.3.14.

5.3.2 Surface Water

Existing Environment

The DCM is situated in the Mammy Johnsons River catchment, a tributary of the Karuah River. The Karuah River, which rises in the Chichester State Forest, drains to Port Stephens some 40 km south of DCM. Mammy Johnsons River is similar in catchment area and length to the Karuah River at their confluence near the village of Stroud Road. The Mammy Johnsons River flows through an undulating landscape which has been extensively cleared for cattle grazing, as is the case in the general Project area (Figure 2).

The DCM is situated west of the lower reaches of Mammy Johnsons River and includes the approved diversion of Coal Shaft Creek (Figure 2). Coal Shaft Creek is a small tributary of the Mammy Johnsons River which originally drained most of the DCM area. The lower section of the creek has been diverted around the DCM mining operations via a purpose-built diversion channel, which rejoins the original Coal Shaft Creek alignment near the DCM rail spur. The Coal Shaft Creek/Mammy Johnsons River confluence is located south of the DCM rail loading infrastructure and approximately 10 km upstream of the Karuah River confluence (Figure 2).

Irrigation of mine water from the MWD is conducted in accordance with the approved Irrigation Management Plan (DCPL, 2008a).

Likely Extent and Nature of Potential Impacts

The Project would include mining extensions in the Coal Shaft Creek catchment area and in the catchment of an un-named watercourse, that flows north and east into Mammy Johnsons River approximately 4 km upstream of the Coal Shaft Creek confluence (Figure 2).

The development of the additional open pit and waste rock emplacement areas would increase the operational area, and hence increase the need for water management, storage and/or disposal. The Project would therefore include development of new agricultural irrigation areas within ML 1427 and MLA 1 as well as raising of the embankment of auxiliary dam No. 2 to provide significant additional on-site storage capacity (Figure 2).

Potential impacts of the Project on water storages, rivers and creeks would include:

- additional modification of the Coal Shaft Creek catchment;
- modification of the catchment areas of the un-named drainage line to the north-west;
- modification to flow regimes in the long-term as a result of the long-term water management features for the Project (including dams, final voids and reconstructed drainage lines);
- increased potential for erosion and sediment movement due to increased exposure of soils during the development of mine infrastructure and mine operation;
- changes to runoff rates and runoff water quality from additional agricultural irrigation areas;
- surface water contamination from accidental spills of hydrocarbons, explosives or other chemicals; and
- effects on the salinity, pH and metals concentrations of runoff or seepage from waste rock emplacements or in operational areas, if PAF materials are not appropriately managed.

Proposed Level and Scope of Assessment

An assessment of potential hydrological impacts of the Project would be conducted and included in the EA. The proposed scope of this assessment would include:

- investigation and analysis of existing flow regimes;
- review of existing surface water quality against relevant Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines;
- updating the existing site water balance to include the Project development areas;
- design concepts and analysis for an integrated water disposal and management system including a combination of agricultural irrigation areas and augmentation of water storages (i.e. raising of auxiliary dam No.2 embankment) (Figure 2);
- development and use of hydrological models, where necessary, to quantify the potential impacts on hydrological conditions;
- description of long-term water management concepts including drainage of final landforms;
- development of a provisional final void water balance model to characterise water levels, water quality and filling characteristics post mining; and
- development of measures to manage/mitigate/avoid potential impacts, if required.

5.3.3 Groundwater

Existing Environment

The sedimentary rocks found at the DCM generally have low primary or intergranular porosity and permeability. Groundwater is present in fissures and fractures that are developed in the coal seams and massive sandstones, and in alluvial aquifers.

Groundwater monitoring at the DCM is conducted in accordance with the Environmental Monitoring Program (DCPL, 2008b). Monitoring is undertaken in deep and shallow bores for potential mining effects on groundwater levels and quality in known aquifers, including the potential effects of irrigation.

Monitored groundwater levels are generally consistent with drawdown levels predicted in the Duralie Coal EIS (i.e. groundwater level drawdowns due to open pit mining) (DCPL, 2007f). The Annual Environmental Management Report (AEMR) (DCPL, 2007f) also reports that variations in groundwater levels of less than one metre have been recorded in the DCM irrigation areas.

Likely Extent and Nature of Potential Impacts

Potential impacts of the Project on groundwater resources include:

- groundwater drawdown effects and alteration of groundwater flow directions as a result of open pit dewatering;
- impacts on other groundwater users in the vicinity of the Project;
- impacts on groundwater quality; and
- long-term (i.e. post-closure) changes to groundwater levels, flow directions and quality in the vicinity of final voids.

Proposed Level and Scope of Assessment

An assessment of potential hydrogeological impacts of the Project would be conducted and included in the EA. The proposed scope of this assessment would include:

- characterisation of the existing groundwater regime;
- development of a numerical groundwater model;
- evaluation of the potential impacts of the Project on the groundwater environment during the operational and post-decommissioning phase; and
- development of measures to manage/mitigate/avoid potential impacts on groundwater resources, if required.

Desktop evaluations and preliminary groundwater baseline studies for the Project commenced in 2007.

5.3.4 Air Quality

Existing Environment

The Air Quality Management Plan (DCPL, 2002a) outlines the dust management strategy for the DCM and the Air Quality Monitoring Program (DCPL, 2007d) details the monitoring network used at the mine. Ambient air quality in the vicinity of the DCM is monitored using a network of standard dust deposition gauges and two high volume air samplers (for particulate matter sampling) located at nearby residential locations.

Dust deposition rates and annual average concentrations of particulate matter less than 10 microns in size (PM_{10}) during the period July 2006 to June 2007 were within the relevant DECCW criteria when accounting for other non-mine dust and particulate matter sources (DCPL, 2007f).

Likely Extent and Nature of Potential Impacts

Air quality emissions from the Project would occur as a result of the following activities:

- vegetation clearance and topsoil stripping from new disturbance areas;
- waste rock blasting, excavation, haulage and dumping;
- ROM coal excavation, haulage, stockpiling and sizing activities;
- ROM coal rail loading activities; and
- wind-blown emissions from ROM coal stockpiles, waste rock emplacements and operational disturbance areas.

Project greenhouse gas emissions would arise from the use of on-site use of fuels and explosives. Indirect greenhouse gas emissions would also arise from on-site use of electricity.

Proposed Level and Scope of Assessment

An assessment of potential air quality impacts would be undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Department of Environment and Conservation [DEC], 2005a) and included in the EA. The scope of the assessment would include:

- compilation and evaluation of local meteorological data, including wind speed and direction, temperature, rainfall and evaporation;
- characterisation of background air quality, including dust deposition and suspended particulates (total suspended particulates and PM_{10});
- development of a predictive air quality model;
- assessment of the air quality impacts associated with relevant operational scenarios during the life of the Project;
- comparison of the predicted dust deposition and suspended particulate levels against relevant criteria;
- an assessment of potential greenhouse gas emissions (Scopes 1 to 3) in accordance with the Australian Greenhouse Office *Factors and Methods Workbook* (2009); and
- development of measures to manage/mitigate/avoid potential air quality and greenhouse gas emissions.

5.3.5 Noise and Blasting

Existing Environment

The DCM Noise Monitoring Program (DCPL, 2007b) includes the requirement for quarterly surveys to quantify the overall amenity and intrusive noise emissions from the mine. Surveys have also been undertaken in response to noise complaints. Noise levels during the period 2006 to 2007 were within the relevant limits stated in the EPL and DC 168/99 (DCPL, 2007f).

Blasting is undertaken in accordance with the Blasting/Vibration Management Plan (DCPL, 2002b). Blast monitoring is undertaken at specified nearby monitoring locations for all blasts. Monitored blast overpressure and vibration levels during the period 2006 to 2007 were within the relevant limits stated in the EPL and DC 168/99 (DCPL, 2007f).

Likely Extent and Nature of Potential Impacts

Noise (and where relevant, blasting) emissions from the Project would occur as a result of the following activities:

- vegetation clearance and topsoil stripping from new disturbance areas;
- waste rock blasting, excavation, haulage and dumping;
- ROM coal excavation, haulage, stockpiling and sizing activities;
- waste dump profiling and topsoil placement for rehabilitation;
- ROM coal rail loading activities;
- rail noise associated with rail movements of ROM coal from the DCM to the SCM; and
- road traffic noise associated with the transport of materials, personnel, consumables and waste materials to and from the site.

Proposed Level and Scope of Assessment

An assessment of potential noise and blasting impacts would be undertaken in accordance with the *Industrial Noise Policy* (INP) (NSW Environment Protection Authority [EPA], 2000), *Environmental Noise Control Manual* (EPA, 1994), *Environmental Criteria for Road Traffic Noise* (EPA, 1999) and *Assessing Vibration: A Technical Guideline* (DEC, 2006). The scope of the assessment would include:

- characterisation of background noise levels;
- compilation and evaluation of local meteorological data in accordance with INP methodology;
- development of a predictive noise model;
- assessment of the noise impacts associated with key operational scenarios during the life of the Project;
- assessment of potential transport noise impacts associated with rail and traffic movements;
- comparison of the predicted noise levels against relevant criteria;
- analysis of potential blasting impacts including blast overpressure and ground vibration at potentially sensitive receptors; and
- measures to manage/mitigate/avoid potential noise and blasting impacts, if required.

Project noise baseline studies (establishment of background noise monitoring) commenced in 2007.

5.3.6 Terrestrial Flora and Fauna

Existing Environment

Flora and fauna assessments were conducted as part of the Duralie Coal EIS (DCPL, 1996). At the time of preparation of the Duralie Coal EIS, approximately 90 per cent (%) of the DCM application area was cleared grassland (with scattered trees) used for cattle grazing, with approximately 10% of the area comprising regrowth or remnant vegetation (DCPL, 1996).

Project extensions would largely be located within land that has been cleared as part of past rural landuse practices and logging. Within the DCM area, the presence of remnant vegetation is limited due to the extent of past agricultural land clearing.

EcoBiological has undertaken flora and fauna surveys of the Project area and surrounds between 2007 and 2009. EcoBiological has re-mapped the vegetation communities previously mapped and described by ERM Mitchell McCotter (1996) and conducted fauna surveys in April, July and November 2007, August 2008, and January, February and April 2009.

The DCM Vegetation Clearance Protocol (DCPL, 2002c) outlines the vegetation clearance management measures, including pre-clearance surveys (and associated fauna management strategies) and habitat assessment.

No threatened flora species have been recorded at the DCM or in the Project area to date (Cenwest Environmental Services, in prep.).

A number of threatened fauna species have been recorded at the DCM and/or in the Project area and surrounds including those described in Table 3.

Table 3
Threatened Terrestrial Fauna Species Recorded within the Project Area and Surrounds

Common Name	Scientific Name	Conservation Status	
		NSW *Threatened Species Conservation Act, 1995* (TSC Act[1])	EPBC Act[2]
Amphibians			
Giant Barred Frog	*Mixophyes iteratus*	E	E
Stephens' Banded Snake	*Hoplocephalus stephensii*	V	-
Birds			
Rose-crowned Fruit-Dove	*Ptilinopus regina*	V	-
Swift Parrot	*Lathamus discolor*	E	E
Sooty Owl	*Tyto tenebricosa*	V	-
Powerful Owl	*Ninox strenua*	V	-
Glossy Black-cockatoo	*Calyptorhynchus lathami*	V	-
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	-
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus*	V	-
Speckled Warbler	*Pyrrholaemus sagittata*	V	-
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-

Table 3 (Continued)
Threatened Terrestrial Fauna Species Recorded within the Project Area and Surrounds

Common Name	Scientific Name	Conservation Status	
		TSC Act[1]	EPBC Act[2]
Mammals			
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-
Common Planigale	*Planigale maculate*	V	-
Koala	*Phascolarctos cinereus*	V	-
Squirrel Glider	*Petaurus norfolcensis*	V	-
Eastern Freetail-bat	*Mormopterus norfolkensis*	V	-
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V	-
Large-footed Myotis	*Myotis macropus*	V	-

Source: DCPL (1996), Place Planning and Design (2003), EcoBiological (in prep.).

[1] Status under the TSC Act (current as at September 2009).

[2] Status under the EPBC Act (current as at September 2009).

V Vulnerable.

E Endangered.

Likely Extent and Nature of Potential Impacts

The development of the Project would include additional open pit and waste rock emplacement development within MLA 1 and ML 1427.

Supplementary land disturbance areas would also be associated with the development of Project supporting infrastructure such as water management structures, dams, hardstands, haul roads and borrow pits as determined by the detailed Project design.

The DCM irrigation areas would also be expanded in MLA 1 and ML 1427.

Potential impacts of the Project include:

- clearing of native vegetation;
- removal of dead wood and loss of hollow-bearing or dead trees;
- bushrock removal;
- alteration of surface drainage regimes;
- alteration of groundwater dependent ecosystems;
- loss of habitat connectivity;
- introduced flora and fauna;
- Project associated noise, artificial lighting and traffic impacts on terrestrial fauna;
- bushfire risk; and
- spread of Chytrid fungus.

Proposed Level and Scope of Assessment

A terrestrial flora and fauna assessment would be undertaken for the EA. The assessment would include a compilation of the recent survey results conducted by EcoBiological (in prep.). The assessment would be undertaken in accordance with the *Draft Guidelines for Threatened Species Assessment* (DEC and DPI, 2005) and would include the following:

- Compilation of the results of the previous flora and fauna surveys, habitat assessments and flora and fauna impact assessments conducted for the Project area and surrounds.
- Mapping the distribution of vegetation communities on DCPL-owned land.
- Reporting on targeted surveys for threatened fauna species known or considered possible occurrences within the Project area and surrounds (including those listed in the Schedules of the TSC Act and EPBC Act).
- Reporting on targeted searches for threatened flora species, threatened ecological communities and critical habitat (as listed under the schedules of the TSC Act and EPBC Act), which may potentially occur in the Project area.
- Listing of flora species and descriptions of vegetation communities within the Project area.
- Listing of fauna species and description of fauna habitat types recorded within the Project area, including aquatic habitat and fauna species.
- Description of the vegetation communities within the Project area.
- Assessment of the quality of habitat types present and their connectivity.
- Assessment of the potential impacts on flora and fauna species including threatened species, populations and ecological communities listed under the TSC Act and the EPBC Act.
- Measures to manage, mitigate and/or avoid potential impacts on flora and fauna including the development of an offset proposal.

5.3.7 Aquatic Ecology

Existing Environment

Aquatic habitats situated in the Project area and surrounds include Mammy Johnsons River, Coal Shaft Creek, existing DCM water management dams (Figure 2), the Karuah River and an unnamed tributary of the Mammy Johnsons River located to the north of the Coal Shaft Creek catchment (Figure 2). As described in Section 1.2, the lower portions of Coal Shaft Creek have been diverted around the existing DCM.

DCPL has conducted aquatic ecology monitoring at a number of locations in the Mammy Johnsons River (upstream and downstream of the DCM), the Karuah River, the unnamed tributary to the north of the DCM and in a diversion dam drain located at DCM. Aquatic ecology monitoring has been conducted since prior to the start of mining operations. Consistently recorded taxa include: the freshwater shrimp *Paratya australiensis*, the coleopteran family Elmidae (beetles); the dipteran family Orthocladinae (midges); the ephemeropteran families, Leptophlebiidae and Baetidae (mayflies), the plecopteran family Grypopterygidae (stone flies), the trichopteran families Hydropsychidae, Philopotamidae (caddis flies) and the molluscan families Sphaeridae (*Pisidium*) and Hydrobiidae (*Posticobia brazieri*) (Invertebrate Identification Australasia, 2008).

Invertebrate Identification Australasia (2009) indicated that:

> *The results of the current survey indicate that both the Mammy Johnsons and Karuah Rivers are still in fair to very good condition and possess a healthy, highly complex and diverse aquatic ecosystem.*
>
> *In conclusion, the results from the current survey suggest that the overall biodiversity and river environmental conditions are very good and that there are no apparent adverse effects on the aquatic macroinvertebrate fauna in the Mammy Johnsons River as a result of any activities arising from the operations of the Duralie Mine.*

Likely Extent and Nature of Potential Impacts

Potential impacts of the Project on aquatic ecology would be generally consistent with those currently experienced from the existing operations, i.e. they would be associated with the loss and/or alteration of areas of aquatic habitat (e.g. alteration of drainage regimes in the Project open pit development areas) and potential effects from irrigation area rainfall runoff water quality. These effects have the potential to result in changes in stream characteristics and aquatic biota assemblages (e.g. aquatic macroinvertebrates).

Proposed Level and Scope of Assessment

An aquatic ecology assessment would be conducted for the Project and included in the EA. It is anticipated that the scope of the aquatic ecology assessment would use the existing aquatic ecology survey and monitoring results and would include the following:

- compilation of existing aquatic ecology survey and monitoring results;
- characterisation of aquatic biota (including macroinvertebrate and fish assemblages) and aquatic habitats based on the existing aquatic ecology survey and monitoring results;
- assessment of potential impacts of the Project on aquatic ecology (including threatened species); and
- development of measures to avoid, mitigate and/or remediate potential impacts on aquatic ecology, if required.

5.3.8 Visual Amenity

Existing Environment

The Gloucester Basin is a valley which extends approximately 37 km in length and is approximately 10 km in width (DCPL, 1998). The majority of the valley is rural in nature and has been cleared as a result of historic landuse practices. The valley presents a strongly defined landform that is visually enclosed and displays an attractive landscape resulting from a combination of natural features and rural landuses. Remnant vegetation generally occurs along ridgelines that define the valley, along watercourses and in isolated patches within the cleared landscape.

Views of the DCM are available from sections of Johnson Creek Road to the north-east, east and south-east of the mine (Figure 2). The number of privately owned dwellings with potential views of the DCM mine landforms and infrastructure is restricted by the rolling topography, ridgelines to the west of the DCM and the DCPL ownership of the majority of land with potential views from the east and south-east.

Likely Extent and Nature of Potential Impacts

Potential visual impacts associated with the Project would include:

- modification to existing views of the DCM due to extension of the open pits and associated highwalls and waste rock emplacement to the north and north-west towards The Bucketts Way (Figure 2);
- expansion of areas of operational night-lighting associated with the open pit development areas; and
- extension of general supporting and irrigation water management infrastructure.

Proposed Level and Scope of Assessment

A visual assessment would be conducted for the Project which would include the following:

- characterisation of the existing visual environment and approved mine landforms;
- identification of sensitive viewsheds (including nearby residences and public roads);
- assessment of the visual sensitivity of these viewsheds;
- assessment of potential impacts due to night lighting;
- assessment of the degree of visual landscape alteration that the Project would have on the sensitive viewsheds, including the use of visual simulations, where appropriate; and
- development of measures to manage/mitigate/avoid potential visual impacts, if required.

5.3.9 Geochemistry of Waste Rock and ROM Coal

Existing Environment

The occurrence of PAF waste rock and its management during mining operations was the subject of a detailed assessment conducted by Environmental Geochemistry International (EGi) for the Duralie Coal EIS. Subsequent reviews of operational PAF waste management measures at the DCM have also been conducted by EGi.

The Duralie Coal EIS geochemical assessment indicated that the bulk of the waste rock at the DCM would be NAF (EGi, 1996). However, a small percentage of the material to be mined was identified as PAF. The PAF units identified included:

- high capacity and fast reacting PAF materials in waste rock within 4 to 6 m of the roof of the coal seam;
- high capacity PAF material in areas of the coal seam floor; and
- lower capacity discontinuous PAF material in the upper waste rock (5 to 20 m).

PAF material management at the DCM is managed in accordance with the PAF Material Management Plan (incorporated in the Rehabilitation Management Plan [DCPL, 2007e]). This plan comprises the following components:

- PAF material separation procedures;
- PAF material storage procedures; and
- monitoring of surface water and groundwater to assess the control of PAF materials.

Likely Extent and Nature of Potential Impacts

Coal to be extracted from the additional open pits may potentially have different geochemical characteristics to material extracted at the DCM to date, as it would include extraction of coal from a new seam (the Clareval Coal Seam).

In addition, sulphur-containing waste rock material has the potential to generate low pH leachate when exposed to surface oxidising conditions, if not managed effectively. As is currently the case, leachates would need to be effectively managed to minimise the potential for adverse effects to water resources.

Proposed Level and Scope of Assessment

An assessment of the geochemical characteristics of the waste rock from the Project open pits would be undertaken and the results would be documented in the EA. The assessment would involve:

- identification of the waste rock types that would be mined;
- selection of representative samples of waste rock and ROM coal;
- laboratory analysis of representative samples using suitable testwork methodology;
- evaluation of the geochemical characteristics; and
- development of management measures to reduce, mitigate or avoid potential impacts, if required.

Preliminary Project geochemical baseline studies commenced in 2007.

5.3.10 Aboriginal Heritage

Existing Environment

Only a limited number of cultural heritage sites or areas of interest have been identified as a result of surveys of the DCM and surrounding area. Aboriginal heritage surveys conducted at the DCM include an initial survey by Brayshaw (1981) and survey by ERM Mitchell McCotter (1995). Both surveys found no Aboriginal heritage sites at the DCM.

In 1998, a tree labelled the “honey tree” was identified between the out-of-pit waste emplacement and the North Coast Railway. The tree is listed on the DECCW Aboriginal Heritage Information Management System database. DCPL has protected the tree with a painted post-and-rail fence. A field survey undertaken in April 2008 identified one isolated artefact (McCardle Cultural Heritage Pty Ltd, 2008).

DCPL understands from the Public Notice dated 11 March 2009 that Garigal Aboriginal Community Inc. has lodged an Application seeking declaration under section 10 (s10) of the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act, 1984* (ATSIHP Act) for the area identified as the Duralie Mining Lease, on the basis that the area:

> *Contains Mammy Johnsons River, ‘a women’s birthing place’ and a sacred site ‘sensitive to Aboriginal men of our community’ and is therefore of particular significance to the Garigal people in accordance with their traditions.*

DCPL notes that the application made by Glen Jonas on behalf of the Garigal Aboriginal Community Inc. dated 6 March 2008 is in regard to the protection of a sacred site 'sensitive to Aboriginal men of our community', and does not refer to the Mammy Johnsons River. Notwithstanding, a letter provided by Ms D Arnold to the Department of the Environment, Water, Heritage and the Arts on 11 December 2008 on behalf of the Garigal Aboriginal Community Inc. has also been considered to be part of the application made under s10 of the ATSIHP Act. This letter refers to the Mammy Johnsons River and the excavation of land at Craven, located south of the SCM.

DCPL lodged a representation in relation to the s10 application on 9 April 2009. The determination by the Minister for the Environment, Heritage and the Arts regarding the Garigal Aboriginal Community Inc.'s s10 application is currently pending.

A targeted search conducted during the August 2009 Project surveys with the assistance of Glen Jonas (who lodged the s10 application) failed to find any evidence of the "men's site" in the study area.

Based on information obtained during the August 2009 field work, the reported "women's birthing site" is understood to be located on the banks of the Mammy Johnsons River, proximal to Mammy Johnson's Grave. The Mammy Johnsons River and the reported "women's birthing site" are not located within ML 1427 nor MLA 1 and are located outside the study area.

The NSW legislation and guidelines that govern the Aboriginal Cultural Heritage Assessment (ACHA) process are separate to the application process under s10 of the ATSIHP Act and the NSW Minister for Planning is not prohibited from making a determination under Part 3A of the EP&A Act if a determination on an application under s10 of the ATSIHP Act is pending.

DCPL has developed and implemented an Aboriginal Heritage Management Plan (AHMP) which is incorporated in the Rehabilitation Management Plan (DCPL, 2007e) for DCM. In accordance with the AHMP, pre-clearance surveys and monitoring of site earthworks is conducted by the Karuah Local Aboriginal Land Council (Karuah LALC). In the event that an artefact is identified, the AHMP describes the process to manage the artefact in accordance with the requirements of the *National Parks and Wildlife Act, 1974.* No artefacts have been reported by the Karuah LALC during pre-clearance surveys or the monitoring of site earthworks to date.

Likely Extent and Nature of Potential Impacts

Based on the results of previous heritage surveys at the DCM and the Aboriginal heritage pre-clearance surveys, it is considered unlikely that a large number of significant heritage sites would be identified in the Project disturbance areas. Sites that occur within the Project open pit and ancillary areas would be disturbed by the Project.

Proposed Level and Scope of Assessment

An ACHA report would be prepared and included in the EA. The report would be prepared in accordance with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (the Draft Guideline) (DEC, 2005b). The assessment process would also be undertaken in consideration of the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC, 1997).

The proposed scope of the Aboriginal heritage assessment is described below:

- a review of DECCW databases and relevant past studies;
- a field survey of Project disturbance areas (where relevant) to identify places or items of Aboriginal cultural heritage significance;

- an assessment of any Aboriginal cultural heritage items or places found during the field survey or in past surveys within the disturbance areas;
- consultation with the registered Aboriginal parties/groups would be incorporated in the Aboriginal heritage assessment (guidance on consultation with Aboriginal people and communities contained in the Draft Guideline and the *National Parks and Wildlife Act 1974: Part 6 Approvals Interim Community Consultation Requirements for Applicants* [DEC, 2004] would be considered); and
- preparation of an Aboriginal heritage survey and impact assessment report for inclusion in the EA.

The Aboriginal heritage assessment report would include measures to manage/mitigate/avoid potential impacts, if required.

5.3.11 Non-Aboriginal Heritage

Existing Environment

The DCM area was part of a very large land grant held from the early nineteenth century by the Australian Agricultural Company.

There are no known non-Aboriginal heritage items within the Project development area. The only listed heritage item in the vicinity of the Project is the Former Weismantels Inn, which is described in the *Great Lakes Heritage Study, 2007* (GLC, 2007) and is listed in Schedule 2 of the Great Lakes LEP. The Former Weismantels Inn is located adjacent to The Bucketts Way to the west of the Project.

Likely Extent and Nature of Potential Impacts

Potential non-Aboriginal heritage impacts associated with the Project would include potential indirect blasting impacts on the Former Weismantels Inn as a result of Project activities moving further north and west.

Proposed Level and Scope of Assessment

An assessment of non-Aboriginal heritage would be undertaken for the Project considering the requirements of the NSW Heritage Manual (Heritage Office and DUAP, 1996). The assessment would include:

- a review of previous relevant heritage studies and heritage databases; and
- consideration of the potential indirect blasting impacts of the Project on the Former Weismantels Inn.

The assessment would include measures to manage/mitigate/avoid potential impacts, if required.

5.3.12 Road Transport

Existing Environment

The DCM is located approximately 35 km west of the Pacific Highway, the main coastal arterial road linking Brisbane and Sydney. The Bucketts Way is the principal road servicing the DCM area and extends from the Pacific Highway at Port Stephens in the south to Gloucester in the north, then to the Pacific Highway at Nabiac in the east. The Bucketts Way is classified as a regional road.

The local minor road network in the DCM area comprises a range of unsealed roads which are used primarily for property access for local landholders and do not carry significant through traffic. Local roads of particular relevance to the Project include Durallie Road and Cheerup Road as they are located within the Project open pit areas (Figure 2).

Access to the DCM for employees, on-site contractors and deliveries is via the mine access road which links the main infrastructure area with The Bucketts Way (Figure 2). The DCM contributes to existing light and heavy vehicle movements on The Bucketts Way.

Likely Extent and Nature of Potential Impacts

The Project increased ROM coal production rate is expected to result in an increase in the quantity of consumables that would be transported by road to the DCM. Increased workforce numbers (i.e. from approximately 120 to 135 employees) would also result in some increases in light traffic to and from the site on a daily basis.

It is anticipated that the Project would result in the closure of Cheerup Road and a portion of Durallie Road due to the extension of open pit mining into MLA 1 (Figure 2).

Proposed Level and Scope of Assessment

An assessment of the potential impacts of the Project on road transport would be undertaken for the EA. Road transport aspects would be assessed considering the requirements of the NSW Roads and Traffic Authority's (RTAs) *Guide to Traffic Generating Developments* (RTA, 2002) and the *Road Design Guide* (RTA, 2000).

The scope of the assessment would include:

- evaluation of the existing road transport environment (e.g. road hierarchy, road conditions, traffic conditions and safety);
- collation of existing road traffic count data from the GLC and the RTA, where available;
- supplementary road traffic counts as necessary;
- assessment of the potential road transport impacts of the Project; and
- evaluation of requirements for necessary local road closures.

5.3.13 Socio-Economics

Existing Environment

The DCM currently employs up to 120 employees and on-site contractors. Approximately 60% of this workforce resides in the local community (i.e. the area between Stroud and Gloucester) (DCPL, 2007f). In addition, the DCM and SCM operations make significant contribution to operational expenditure in the region and the State of NSW. The DCM and SCM also make regular community contribution payments to select community-based projects.

Community liaison regarding the DCM operations includes quarterly CCC meetings. A 24 hour complaints number has been established and provides the local community with a method to register issues or complaints with respect to DCPL's mining activities.

Likely Extent and Nature of Potential Impacts

The additional employment associated with the Project would result in an increase in DCPL's expenditure on wages and on-site contractors and operational expenditure in the regional economy and the State of NSW. In addition the proposed nine year extension of life of the DCM would provide for continuity of employment and extend the duration of the existing direct and indirect economic effects of the DCM.

The production of extra ROM coal would result in additional revenue to DCPL and the collection of additional royalties and taxes by the State of NSW and the Federal Government.

The increase in employment would also potentially result in some marginal additional demand on existing community infrastructure and services in the region, depending on the source of additional DCM staff and on-site contractors.

Proposed Level and Scope of Assessment

In order to assess the potential benefits and costs of the Project, a socio-economic assessment would be conducted and included in the EA. The assessment would include:

- an evaluation of the existing socio-economic and economic environment at a regional level;
- a cost-benefit analysis of the Project;
- an assessment of the potential impacts on the community infrastructure, services and socioeconomic conditions at a regional level; and
- development of management measures to manage/mitigate/avoid potential adverse socio-economic impacts including consideration of post-closure planning with respect to socio-economic issues as required.

5.3.14 Rehabilitation Concepts

Existing Rehabilitation Management and Activities

The DCM Rehabilitation Management Plan (DCPL, 2007e) is part of a greater Rehabilitation and Landscape Management Plan which would include a Final Void Management Plan and a Mine Closure Plan. Both the Final Void Management Plan and Mine Closure Plan are requirements of the DCM Development Consent and are being progressively developed by DCPL.

The objectives of the existing DCM rehabilitation programme are as follows (DCPL, 2007e):

- proactive management of the potential for acid rock drainage;
- creation of a stable landform and landscape which is compatible with the surrounding environment;
- establishment of a permanent, self-sustaining vegetative cover;
- achieving final landuses that are compatible with pre-mining uses including endemic tree cover, waterbodies, wildlife habitat, forestry and grazing; and
- retention without impairment, where practical, of remnant vegetation and habitat on-site.

Revegetation is conducted in accordance with the Rehabilitation Management Plan (DCPL, 2007e). Progressive rehabilitation targets and ongoing rehabilitation works are detailed in the Mining Operations Plans and AEMR. Construction disturbances areas, the southern/south-western corner of the out-of-pit waste rock emplacement and various water management structures and embankments have been rehabilitated (DCPL, 2007f).

Proposed Conceptual Rehabilitation Programme

The EA would include a conceptual rehabilitation programme for the Project. The proposed scope of this programme is provided below:

- development of rehabilitation concepts for the new mine landforms (i.e. final voids, in-pit waste rock emplacements and other new infrastructure associated with the Project);
- proposed integration of the Project landform rehabilitation concepts with the existing rehabilitation plan; and
- short, medium and long-term objectives for rehabilitation.

5.4 LEVEL AND SCOPE OF ASSESSMENT

The key potential environmental issues and potential impacts associated with the Project identified in this Preliminary Assessment are summarised in Table 4 along with the key proposed EA requirements.

Table 4
Key Environmental Issues, Potential Impacts and
Proposed Environmental Assessment Requirements

Key Environmental Issue	Key Potential Impacts	Proposed EARs
Surface Water	• Water quality impacts associated with using contained water for agricultural irrigation. • Increased erosion and sedimentation from new disturbance areas.	• Assessment of potential impacts on surface water features. • Development of a site water balance. • Development of a final void water balance. • Description of the final mine landform drainage design concepts.
Groundwater	• Potential groundwater drawdown effects associated with pit dewatering. • Potential impacts on groundwater quality.	• Assessment of potential impacts on groundwater aquifers and users.
Air Quality	• Potential air quality impacts on surrounding landowners. • Greenhouse gas emissions.	• Assessment of potential air quality impacts on non-Company owned receptors. • Assessment of potential greenhouse gas emissions.
Noise and Blasting	• Potential noise impacts on surrounding landowners associated with mine operations and rail movements. • Blast overpressure and vibration impacts on surrounding landowners from Project blasting.	• Assessment of potential noise impacts, including operational mine and rail traffic noise on non-Company owned receptors. • Assessment of potential blasting impacts on sensitive receivers.
Terrestrial Flora and Fauna	• Clearance of flora species and communities. • Loss of fauna species and clearance of fauna habitat.	• Assessment of potential impacts on critical habitats, threatened species, populations, ecological communities, native vegetation and fauna populations.
Aquatic Ecology	• Potential impacts to the aquatic ecology of water courses within and surrounding the Project area.	• Assessment of potential impacts on aquatic ecology.
Visual Amenity	• Landscape modification. • Night lighting effects.	• Assessment of potential impacts on the visual amenity of sensitive viewsheds.

Table 4 (Continued)
Key Environmental Issues, Potential Impacts and
Proposed Environmental Assessment Requirements

Key Environmental Issue	Key Potential Impacts	Proposed EARs
Waste Rock and ROM Coal Geochemistry	• Release of leachate and contamination of groundwater, surface water and/or soil resources.	• Assessment of the geochemical characteristics of waste rock and ROM coal. • Development of management measures to reduce, mitigate or avoid potential geochemical impacts from waste rock and ROM coal.
Aboriginal Heritage	• Potential impact on Aboriginal heritage items.	• Assessment of potential impacts on Aboriginal heritage.
Non-Aboriginal Heritage	• Potential impact on non-Aboriginal heritage items.	• Assessment of potential impacts on non-Aboriginal heritage.
Road Transport	• Impact on road infrastructure due to increased vehicle movements.	• Assessment of potential road traffic impacts, including transport infrastructure requirements.
Socio-economics	• Socio-economic impact of the Project.	• Assessment of the potential regional socio-economic impacts and benefits, including mine closure.
Rehabilitation concepts	• Potential long-term impacts on water quality and landuse resulting from potential long-term landform stability and leachate issues.	• A justification for the proposed final land form and use in relation to the long-term landuse objectives. • A description of how the site would be progressively rehabilitated.

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