

Assessment Report under the Environmental Protection Act 1994

Eagle Downs Coal Mine Project Proposed by Bowen Central
Coal Management Pty Ltd

June 2010

Prepared by:

Environment and Natural Resource Regulation

Department of Environment and Resource Management

© State of Queensland (Department of Environment and Resource Management) 2010

This document has been prepared with all due diligence and care, based on the best available information at the time of publication. The department holds no responsibility for any errors or omissions within this document. Any decisions made by other parties based on this document are solely the responsibility of those parties. Information contained in this document is from a number of sources and, as such, does not necessarily represent government or departmental policy.

**This publication is available in alternative formats
(including large print and audiotape) on request.**

Contact (07) 322 48412 or email <library@derm.qld.gov.au>

June 2010

#29323

Contents

1	Introduction	4
1.1	Project details	4
1.2	Approvals	4
1.3	Impact assessment process	5
1.3.1	The EIS process	5
1.3.2	Consultation program	7
1.3.3	Environment Protection and Biodiversity Conservation Act 1999	9
2	Matters considered in the EIS assessment report	9
2.1	The final TOR	9
2.2	The submitted EIS	10
2.3	Properly made submissions	10
2.4	The standard criteria	10
2.5	Prescribed matters	10
3	Adequacy of the EIS in addressing the TOR	11
3.1	Notifiable activities	11
3.2	Air quality	11
3.3	Noise	12
3.4	Water resources	12
3.4.1	Groundwater	12
3.4.2	Surface water	15
3.4.3	Surface water contamination	15
3.4.4	Water management assessment	15
3.4.5	Subsidence impacts on surface drainage	16
3.5	Land	18
3.5.1	Soils and Land Capability	18
3.5.2	Characterisation of tailings	18
3.5.3	Dry Rejects Emplacement Area (DREA)	19
3.5.4	Design and concept of the Dry Rejects Emplacement Area (DREA)	19
3.5.5	Operation and management of the DREA	20
3.5.6	Rehabilitation of DREA	20
3.5.7	Rehabilitation of subsided areas	21
3.6	Nature conservation	21
3.6.1	Impact on vegetation communities	21
3.6.2	Impacts on individual species of flora and fauna	22
3.6.3	Impacts on aquatic biology	22
3.6.4	Impacts on habitat corridors	22
3.7	Matters of National Environmental Significance	24
3.7.1	Impact on vegetation communities	24
3.7.2	Impacts on listed species of flora and fauna	24
3.7.3	Mitigation measures	24

3.8	Road Infrastructure and Transport.....	25
3.9	Social Impacts	27
4	Recommendations for conditions for any approval	29
5	Adequacy of the EM plan for the project	29
6	Suitability of the project	29
	Appendix	31

1 Introduction

This report provides an evaluation of the environmental impact statement (EIS) process pursuant to Chapter 3 of the *Environmental Protection Act 1994* (EP Act) for the Eagle Downs Coal Mine Project (called in this report the Eagle Downs Project) proposed by the Bowen Central Coal Management Pty Ltd (BCCM). The Department of Environment and Resource Management (DERM) coordinated the EIS process as the administering authority of the EP Act. This assessment report has been prepared pursuant to Sections 58 and 59 of the EP Act.

The objective of this assessment report is to:

- address the adequacy of the environmental impact statement and the environmental management plan
- summarise key issues associated with the potential adverse and beneficial environmental, economic and social impacts of the Eagle Downs Project and the management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project
- make recommendations on the suitability of the project to proceed and where so, to make recommendations on necessary conditions for any approval required for the project.

Section 58 of the EP Act lists the criteria that DERM must consider when preparing an EIS assessment report, while section 59 of the Act states what the content must be.

In summary, this assessment report addresses the adequacy of the EIS in addressing the final terms of reference (TOR) and the suitability of the draft environmental management plan (EM plan). It also discusses in some detail those issues of particular concern that are either not fully resolved or that require specific conditions to be included in project approvals.

Delivery of this EIS assessment report to the proponent completes the EIS process under the EP Act.

1.1 Project details

The proponent for the Eagle Downs Coal Mine Project is the Bowen Central Coal Joint Venture Parties, consisting of Bowen Central Coal Pty Ltd (50 per cent) and Aquila Coal Pty Ltd (50 per cent). Bowen Central Coal Management Pty Ltd (BCCM) manages the joint venture on behalf of the Bowen Central Coal Joint Venture Parties. The project would involve the development of a greenfield underground coal mine producing up to seven million tonnes a year (Mt/y) of coking coal and thermal coal for export. The project site (Mining Lease Application 70389) is located 20 km south-east of Moranbah in Central Queensland and is approximately 2 km east of the Peak Downs open cut mine. The proposed Eagle Downs Mine would use the longwall method to mine the coal. An overland conveyor would transport coal from the conveyor drift portal to an on-site coal handling and preparation plant (CHPP) where it would be crushed, sized and washed. Coarse rejects and dewatered fine rejects would be hauled by truck from the CHPP to an on-site, dry rejects emplacement area. A rail loop and train loading facilities would be located adjacent to the CHPP and connected to the existing Norwich Park Branch railway. Product coal would be transported to port by rail for export. The mine is expected to operate for more than 50 years.

The project is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The State's EIS process has been accredited for the assessment under Part 8 of the EPBC Act in accordance with the Bilateral Agreement between the Commonwealth of Australia and the State of Queensland (2004). The controlling provisions are sections 18 and 18A (Listed threatened species and communities).

1.2 Approvals

The following approvals are required for the Eagle Downs Project:

Approval	Legislation (Administering Authority)
Environmental authority (mining activities)	<i>Environmental Protection Act 1994</i> (Department of Environment and Resource Management)
Mining Lease (Mining Lease Application (MLA) 70389 for mining)	<i>Mineral Resources Act 1989</i> (Mines and Energy, Department of Employment, Economic Development and Innovation)
Water Licences (Taking water from an aquifer and using the water for coal processing and dust suppression. Pit dewatering which interferes with	<i>Water Act 2000</i> (Department of Environment and Resource Management)

the flow of water in an aquifer)	
Approval to undertake action that may impact on a matter of national environmental significance (Nationally listed threatened species and ecological communities)	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Department of Environment, Water, Heritage and Arts)
Clearing permits for relocating any threatened species	<i>Nature Conservation Act 1992</i> (Department of Environment and Resource Management)

1.3 Impact assessment process

1.3.1 The EIS process

The EIS for the Eagle Downs Project was conducted under Chapter 3 of the EP Act. The assessment process was initiated by BCCM on 19 November 2007 by lodgement of an Environmental Authority (EA) application for MLA70389. DERM gave notice to BCCM on 14 December 2007 that the EA application was a non-standard application requiring an EIS under Chapter 3 of the EP Act. The draft terms of reference (TOR) and Initial Advice Statement for the Eagle Downs Project were received by DERM on 7 February 2008.

DERM issued a notice of publication of the draft TOR to the BCCM on 4 March 2008. A public notice was placed on the DERM website and in the Emerald Central Queensland News on 7 March 2008, and in the Courier-Mail and Mackay Daily Mercury on 8 March 2008. The draft TOR were available for public comment from 10 March 2008 to 22 April 2008. BCCM issued copies of the TOR notice to affected and interested persons.

Eighteen submissions were received by DERM on the draft TOR within the public comment period. These submissions, together with one from DERM, were forwarded to the BCCM on 7 May 2008. One late submission outside the comment period was accepted and forwarded to BCCM on 13 May 2008.

On 30 May 2008, BCCM requested an extension to submit their response to comments on the draft TOR to 4 July 2008 and this was granted on the same day. DERM considered all submissions received on the draft TOR, and BCCM's response, prior to issuing the final TOR on 22 July 2008.

BCCM submitted the draft EIS on 30 January 2009 to DERM for review prior to public notification. DERM compared the draft EIS to the final TOR and found that the draft EIS did not address the final TOR in an acceptable form. DERM held a meeting with the proponent on 24 February 2009 to discuss changes needed to make the draft EIS acceptable. On 27 February 2009, DERM agreed to a request by BCCM to extend the decision period on the draft EIS to 27 March 2008 to allow for changes to be made to the submitted EIS.

On 13 March 2009, BCCM submitted their amended draft EIS to DERM.

On 14 April 2009, DERM issued a notice of decision to proceed with the EIS to BCCM under s49(5) of the EP Act. The public notification and submission period was set at the minimum 30 business days.

A public notice was placed on DERM's website on 17 April 2009 and advertised in the Courier Mail, Mackay Daily Mercury and the Emerald Central Queensland News on 18 April 2009. The draft EIS was available for public comment from 20 April 2009 to 1 June 2009. BCCM issued copies of the public notice to affected and interested persons.

DERM received nineteen submissions on the draft EIS within the submission period, one late submission was also received and accepted by DERM. These included twelve submissions from state government departments, one from the Commonwealth Department of the Environment, Water, Heritage and the Arts, one submission from the Isaac Regional Council and five from non-government organisations. These submissions, together with a submission from DERM, were forwarded to BCCM on 8 May 2009.

Due to the large number of submissions on the draft EIS, on 8 July 2009 and again on 10 August 2009, BCCM requested extensions to the period in which they were required to provide a response. DERM agreed to both requests for a longer response period. BCCM submitted their response to the submissions, and an EIS addendum, on 28 August 2009. The EIS addendum included amendments to the environmental management plan (EM plan). Copies of the response to the submissions and EIS addendum were sent to the respondents for comment on 31 August 2009.

DERM received eight submissions on the proponent's response to submissions and EIS addendum. These included six submissions from state government departments, one from the Commonwealth Department of the Environment, Water, Heritage and the Arts and one submission from the Isaac Regional Council. DERM also

prepared a submission on the proponent's response to submissions and the EIS addendum.

As a result of outstanding issues with the EIS, on 25 September 2009, DERM issued a notice under section 555 of the EP Act extending the period in which the decision under s56A of the EP Act would be made. The notice extended the decision date until 20 November 2009. The reason for the extension was to allow BCCM time to provide additional information in response to the advisory body comments and make all appropriate amendments to the submitted EIS.

On 5 November 2009, BCCM requested an extension of time to submit their response to submissions to DERM to the 7 December. On 17 November 2009, BCCM requested a further extension to 23 December 2009. In response to requests from BCCM for additional time, on 18 November 2009 DERM issued another notice under s555 of the EP Act extending the period in which the s56A decision would be made until 29 January 2010.

The proponent held meetings with the following agencies to discuss outstanding issues with the draft EIS: Department of Transport and Main Roads on 26 November 2009; Department of Employment and Industrial Relations (DEEDI) on 30 November 2009; Queensland Police Services and Department of Communities, Housing and Homelessness on 2 December 2009; and DERM on 16 December 2009.

On the 23 December 2009, BCCM provided additional information and an amended EM plan. Copies were sent to the relevant government departments on 23 December 2009.

DERM received six submissions on the additional information from government departments. DERM considered the proponent had still had not adequately addressed the issues and this needed to occur before the EIS could proceed to the assessment report stage. Consequently, on 29 January 2010 another notice was issued to the proponent under s555 of the EP Act, extending the s56A decision date to 26 February 2010.

On 5 February 2010, the proponent held a meeting with DERM to discuss outstanding issues with the EIS.

On 22 February 2010, the proponent requested an extension till the 26 March 2010, to respond to issues raised in an attachment to DERM's latest notice under s555 of the EP Act. On 24 February 2010, DERM agreed to the requested extension and issued a new s555 notice in which the date for the decision under s56A of the EP Act was set at 16 April 2010.

On 26 March 2010, the proponent submitted their Response to Issues Raised by DERM on 29 January 2010 on the Eagle Downs EIS. Copies of this response were sent to relevant internal staff.

On 16 April 2010, DERM decided, under s56A of the EP Act, that the submitted EIS should proceed under Division 5 (EIS assessment report) and Division 6 (Completion of process) of the EP Act. A notice of the decision to allow the submitted EIS to proceed was issued to BCCM on 19 April 2010.

On 23 April 2010, DERM received a submission from BCCM, Response to DERM Soils and Land Suitability Submission 27 January 2010.

In the preparation of this EIS assessment report, DERM considered submissions and comments from members of the advisory body and other interested parties made at all stages of the EIS process. This EIS assessment report is available on DERM's website www.derm.qld.gov.au.

1.3.2 Consultation program

Public consultation

In addition to the statutory requirements for public notification of the TOR, the draft EIS and identification of interested and affected parties, the proponent undertook community consultation with the affected landowners and government agencies during the public submission period of the draft EIS. The proponent also circulated information on the Eagle Downs Project to the community.

Advisory Body

DERM invited the following organisations to assist in the assessment of the TOR and EIS by participating as members of the advisory body for the project:

- Arrow Energy Limited
- Barada Barma, Kabalbara and Yetimaria People #4
- Isaac Regional Council
- Capricorn Conservation Council
- Commonwealth Department of Environment, Water, Heritage and the Arts
- North Queensland Land Council
- Department of Communities
- Department of Community Safety
- Department of Infrastructure and Planning
- Department of Transport and Main Roads
- Department of Employment, Economic Development and Innovation
- Fitzroy Basin Association
- Mackay Regional Council
- Hypower Engineering
- Mackay Conservation Council
- Powerlink Queensland
- Queensland Health
- Queensland Police Service
- Queensland Rail Limited
- Sunwater
- Treasury
- Woorra Consulting Pty Ltd.

State Government Changes

Due to Machinery of Government changes from 26 March 2009 (see Public Service Department Arrangements Notice No.2 2009), the changes summarised in Table 1 occurred to Queensland Government departments referred to in this report.

Table 1

New Department (as of 26 March 2009)	Previous Department/s
Department of Employment, Economic Development and Innovation – DEEDI	Department of Primary Industries and Fisheries Department of Mines and Energy Department of Tourism, Regional Development and Industry Department of Employment and Industrial Relations
Department of Environment and Resource Management – DERM	Environmental Protection Agency Department of Natural Resources and Water
Department of Transport and Main Roads – DTMR	Department of Main Roads Queensland Transport
Department of Communities - DoC	Department of Communities Department of Housing Department of Local Government, Sport and Recreation Disability Services Queensland
Department of Community Safety - DCS	Department of Emergency Services

Local Government Changes

Due to amalgamations of local Councils since the start of this EIS, the changes summarised in Table 2 occurred to Queensland Local Government Councils referred to in this report.

Table 2

New Councils (as of 15 March 2008)	Previous Councils
Isaac Regional Council – IRC	Belyando Shire Council; Nebo Shire Council; Broadsound Shire Council;
Mackay Regional Council – MRC	Mackay City Council; Mirani Shire Council; Sarina Shire Council;

Public notification

In accordance with the statutory requirements, advertisements were placed in the Courier-Mail, Mackay Daily Mercury and Emerald Central Queensland News to notify the availability of the draft TOR and EIS for review and public comment as stated in Section 1.3.1. In addition, notices advising the availability of the draft TOR and the EIS for public comment were displayed on the DERM website.

The draft TOR and draft EIS were placed on public display at the following locations during their respective public notification/submission periods:

- DERM website
- DERM Customer Referral Centre, 160 Ann Street, Brisbane
- DERM Central West District Office, 99 Hospital Road
- Moranbah Town Library
- Hansen & Bailey, 215 Adelaide Street, Brisbane.

Copies of the draft EIS were available for purchase from Hansen & Bailey.

Site visit

A site visit and presentation on the project for the advisory body took place on 5 May 2009. The proponent escorted members of the advisory body around key features of the project site.

Also an advisory body meeting and project presentation was held in Brisbane on 12 May 2009.

1.3.3 Environment Protection and Biodiversity Conservation Act 1999

On 3 January 2008, the Eagle Downs Coal Mine Project (initially called the Peak Downs East Coal Mine Project) was referred (EPBC 2008/3945) for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the (then) Commonwealth Department of Environment and Water Resources (DEWR). On 31 January 2008, the now Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) decided that the project was a controlled action and the controlling provisions are sections 18 and 18A (listed threatened species and ecological communities) of the EPBC Act. The State's EIS process was accredited for the assessment under Part 8 of the EPBC Act in accordance with the Bilateral Agreement between the Commonwealth of Australia and the State of Queensland (2004). The DEWHA was included as an advisory body for the Eagle Downs Project and commented on the draft TOR and the EIS documents.

The project area contains endangered ecological communities listed under the EPBC Act, namely Brigalow (*Acacia harpophylla* dominant and subdominant communities), Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (formerly listed as Bluegrass (*Dichanthium spp*) dominant grasslands of the Brigalow Belt Bioregions) and semi-evergreen vine thickets of the Brigalow Belt. The ornamental snake (*Denisonia maculate*), a species listed under the EPBC Act as vulnerable, was identified during the EIS process as present on the project area.

This EIS assessment report is required to contain enough information about the relevant impacts of the action and the proposed mitigation measures to let the Commonwealth Environment Minister make an informed decision on whether or not to approve the taking of the action pursuant to provisions of the EPBC Act.

A copy of this EIS assessment report will be given to the Commonwealth Environment Minister for consideration when deciding, under section 133 of the EPBC Act, whether to approve the action. Matters of national environmental significance are discussed in section 3.7 of this EIS assessment report.

2 Matters considered in the EIS assessment report

Section 58 of the EP Act requires, when preparing this EIS assessment report, the consideration of the following matters:

- the final TOR for the EIS
- the submitted EIS (including the proponent's responses, addendum and amended EM plan)
- all properly made submissions and any other submissions accepted by the chief executive
- the standard criteria
- another matter prescribed under a regulation.

These matters are addressed in the following subsections.

2.1 The final TOR

The final TOR document, issued on 26 June 2007, was considered when preparing this EIS assessment report. While the TOR was written to include all the major issues associated with the project that were required to be addressed in the EIS, they were not exhaustive, nor were they to be interpreted as excluding all other matters from consideration. The TOR stated that if significant matters arose during the course of preparation of the EIS

that were not incorporated in the TOR (e.g. currently unforeseen issues that emerge as important or significant from environmental studies) then these issues should also be fully addressed in the EIS.

Where matters outside of those listed in the final TOR arose they were addressed in the EIS and considered when preparing this EIS assessment report.

2.2 The submitted EIS

The submitted EIS was considered when preparing this EIS assessment report. The submitted EIS comprised the following:

- draft EIS that was publicly released on 20 April 2009
- the proponent's response to submissions report (Response to Public Submissions, amended EM plan & addendum) received by the DERM on 28 August 2009 that was provided to relevant advisory body members
- the additional information and amended EM plan received by the DERM on 23 December 2009 that was provided to relevant advisory body members
- the proponent's Response to Issues Raised by DERM on 29 January 2010 on the Eagle Downs EIS, received by DERM on 26 March 2010
- the proponent's Response to DERM soils and land suitability submission 27 January 2010' received by DERM on 23 April 2010.

2.3 Properly made submissions

Twenty submissions (including a submission by DERM) were received on the submitted draft EIS. Sixteen submissions (including two submissions by DERM) were received on the proponent's response to submissions and second response to submissions. All were properly made and all were considered when preparing this EIS assessment report.

2.4 The standard criteria

Section 58 of the EP Act requires that, among other matters, the standard criteria listed in Schedule 3 of the EP Act must be considered when preparing the EIS assessment report. The standard criteria are:

- (a) the principles of ecologically sustainable development as set out in the National Strategy for Ecologically Sustainable Development
- (b) any applicable environmental protection policy
- (c) any applicable Commonwealth, State or local government plans, standards, agreements or requirements
- (d) any applicable environmental impact study, assessment or report
- (e) the character, resilience and values of the receiving environment
- (f) all submissions made by the applicant and submitters
- (g) the best practice environmental management for activities under any relevant instrument, or proposed instrument, as follows—
 - (i) an environmental authority
 - (ii) an environmental management program
 - (iii) an environmental protection order
 - (iv) a disposal permit.
- (h) the financial implications of the requirements under an instrument, or proposed instrument, mentioned in paragraph (g) as they would relate to the type of activity or industry carried out, or proposed to be carried out, under the instrument
 - (i) the public interest
 - (j) any applicable site management plan
 - (k) any relevant integrated environmental management system or proposed integrated environmental management system
 - (l) any other matter prescribed under a regulation.

2.5 Prescribed matters

In addition, section 58 of the EP Act requires that the following prescribed matters, under the Environmental

Protection Regulation 2008, are considered when making an environmental management decision for this project:

- Section 51, matters to be considered for environmental management decisions
- Section 52, conditions to be considered for environmental management decisions
- Section 53, matters to be considered for decisions imposing monitoring conditions
- Section 55, release of water or waste to land
- Section 56, release of water, other than stormwater, to surface water
- Section 57, release of stormwater.

3 Adequacy of the EIS in addressing the TOR

The submitted EIS adequately addressed the TOR. This section of the EIS assessment report discusses the main issues and associated commitments by the proponent, and makes recommendations about conditions to be included in approvals for the project.

3.1 Notifiable activities

While the proponent has identified and listed the relevant ERA's for the project, notifiable activities were not adequately addressed in their response. The proponent was correct in stating notification will need to be submitted to the contaminated lands register. However, all potential notifiable activities should have been identified in the EIS documentation and should be clearly identified and listed in the EM plan.

It is recommended that the proponent identify and list, in accordance with section 203 (content requirements for submitted EM plan) of the EP Act, all relevant mining activities. Any notifiable activity, as defined in Schedule 3 of the EP Act would be a relevant mining activity if it is directly associated with, or supports or facilitates, the mining or processing of coal on the Eagle Downs mining lease or leases.

3.2 Air quality

The EIS was adequate with respect to the TOR with regards to air matters. The proponent adequately addressed air issues including dust emissions, greenhouse gas emissions and odour.

The impacts of the Eagle Downs Project on the air environment include small increases in predicted maximum 24-hour and annual average PM2.5, maximum 24-hour PM10, annual average ground level concentrations of total suspended particulates (TSP) and dust deposition concentrations at the Winchester Downs Homestead, which is the closest place of habitation or work. The predicted values are within the air quality goals in the Environmental Protection (Air) Policy 2008 (EPP (Air)).

The odour assessment for emissions from the underground mine ventilation shaft found that it is unlikely that odour from any potential ventilation shaft sites will be detectable at the Winchester Downs Homestead. This is due to the homestead being 1500 metres from the proposed underground mining area at the closest point.

Mitigation measures proposed to manage potential impacts of the Eagle Downs Project on the air environment include:

- limiting the amount of cleared area
- watering of unsealed roads
- site traffic control
- strict definition of unsealed roads
- revegetation of cleared areas, wherever feasible
- management of dust on the dry rejects emplacement area (DREA)
- watering of the dry reject haul roads
- using conveyors for transporting raw and product coal.

The above mitigation measures are considered adequate to manage the air impacts of the project.

The proponent needs to meet their commitments to address air issues, including:

- consulting with Queensland Rail in relation to the design and operation of the train loading facilities to ensure best practice of train loading
- developing a strategy to control greenhouse gas emissions prior to the commencement of mining operations to ensure compliance with the Federal Government's Carbon Pollution Reduction Scheme.

Recommended EP Act Conditions

The conditions regarding air quality that are outlined in the draft EM plan are mostly suitable for inclusion in the draft environmental authority, with the exception that condition B2 should be amended in accordance with the current DERM standard condition in Appendix 1 of this report.

3.3 Noise

The EIS adequately addressed the TOR in regard to noise matters.

The noise levels predicted for the Eagle Downs Project at the Winchester Downs Homestead (closest noise sensitive receptor) are mostly within the noise limits of the Environmental Protection (Noise) Policy 2008 (EPP (Noise)) and the Planning for Noise Control Guideline. The only exception is that under certain weather conditions the night time LAeq noise level is predicted to be 25.5 dB, which is marginally over the 25 dB LAeq limit derived in accordance with the guideline. However, that marginal exceedence is not expected to cause an unacceptable noise impact.

Blasting impact levels are predicted to comply with the relevant criteria at the closest neighbouring residence.

To mitigate the potential noise impacts, the proponent has made commitments in the EIS, including:

- a commitment to maintain all plant and equipment in good working order to ensure compliance with the noise criteria
- a commitment to maintain a complaints handling protocol to respond to any complaints in relation to noise and investigate these where necessary.

Recommended EP Act Conditions

The conditions regarding noise that are outlined in the draft EM plan are not all consistent with DERM's standard conditions. It is recommended that the draft environmental authority contain conditions D1 to D15 in Appendix 1 of this report. These conditions include amendments to conditions on vibration limits and airblast overpressure levels at sensitive or commercial places.

3.4 Water resources

The EIS was generally adequate with respect to the TOR regarding water resources.

3.4.1 Groundwater

The EIS discussed the following groundwater issues:

- groundwater inflow to the longwall panels from the coal seams
- the potential impacts of underground mine dewatering on regional groundwater levels
- whether subsidence cracking will create hydraulic connectivity between the mine and the base of the shallow weathered/fractured rock aquifer
- the potential impacts on privately-owned farm bores
- groundwater contamination.

The mine workings will need dewatering due to the inflow of groundwater from the coal seams and from mined longwall panels in overlying seams where goafs and continuous cracking would connect panels to the current mine workings.

The mine pit water, including groundwater inflows, would be stored in the mine water dam for use in the mining operations. DERM will require the proponent to obtain an approval under the *Water Act 2000* to take water from aquifers through mine dewatering.

The EIS notes that there are no private bores in use above the proposed longwall mining area. However, there is one high yielding bore about 200 metres from the northern boundary of the proposed mining lease and a cluster of bores on the eastern boundary. The predictive modelling indicates that the water level in these bores

could be reduced by about 1.3 metres and 2.2 metres respectively as a result of mining. The EIS concludes that there should be minimal impact on bore yields. The impact on water levels should be detected through the ground water monitoring program. It is recommended that BCCM provide a commitment to negotiate 'make good' arrangements with the relevant bore user if the monitoring program shows that mining activities are impacting on nearby water supplies. These arrangements could, for example include, deepening the bore, changing a pump setting, establishing an alternative supply or providing compensation.

The EIS identified that there is the potential for contamination of the shallow aquifer to occur from spills and contamination by metals and hydrocarbons from mine workshop, waste disposal and fuel storage areas. However, the proponent's commitments to provide adequate bunding and immediately cleaning up of spills are considered adequate to prevent contamination of the shallow groundwater system. The proposed ground water monitoring program is also considered adequate for detecting any previously unforeseen impact due to mining on the shallow groundwater before it affects the nearby operating stock bores.

The EIS did not identify any potential for contamination of the coal seam aquifers as the underground mining operations do not involve any potential contaminant. The proponent has made a commitment that any waste oil from the underground roof supports will be collected, transported to the surface and disposed of in accordance with the site waste management system.

The subsidence predictions and predictive groundwater modelling indicate that although there would be a significant impact on the potentiometric surface of the deep coal seam aquifers, the impact of mining and dewatering of the coal seams on the shallow aquifer would be minimal. The EIS states that this is due to the essentially impermeable nature of the Fort Cooper Coal Measures which separate the aquifers and the fact that continuous fracturing due to the presence of goafs will not intercept the base of the shallow aquifer and provide drainage pathways to the mine. Furthermore, the EIS assessed that surface cracking will not result in hydraulic connection with the mine. There will however be some minor seepage via natural fractures and joints (the inherent permeability), from the shallow aquifer to the underlying depressurised mining domain, resulting in the cone of depression in the water table.

In considering the geochemistry of the rejects and spoil from the excavation of the drift, the EIS states that any seepage of leachate from waste deposition is unlikely to adversely impact on the existing quality of groundwater of the shallow aquifer. However, surface cracking to an estimated maximum depth of 15 metres may enhance the rate of infiltration of leachate to the shallow aquifer.

DERM advised the proponent of concerns about groundwater impacts, including:

- the risk of water percolating through the Dry Reject Emplacement Area (DREA) over a long period during mining operations into fractured, subsided zones that would be connected to shallow groundwater and surface water in other areas on and off the site
- the DREA having a higher hydraulic head than the surrounding watertable, which would result in water going through the DREA and being pushed under pressure into the shallow groundwater aquifer and mine workings
- the fact that the methods used in the EIS to model potential subsidence may not accurately predict the likely depth of subsidence, or how extensively the surface cracking, and to what the degree, the surface would be hydraulically connected to underground mining.

In responses to DERM's concerns, the proponent stated that the groundwater study, geochemical assessment and surface water assessment in the EIS concluded that there is no significant potential for groundwater contamination of the shallow aquifer as a result of the DREA. No further sampling and analysis was undertaken by the proponent to support these claims. The proponent highlighted relevant EIS predictions and commitments in their responses, including:

- The concentration of soluble metals and salts in runoff and seepage from these materials was unlikely to present any environmental risk for on site or downstream water quality.
- On the basis of Acid Base Account testing, acid generation from these materials was unlikely due to the lack of sulfide.
- The properties of soil found over much of the project site, which is very rich in clay and extends to a depth of 12 m deep, is likely to allow little or no crack development due to its plastic and non-brittle nature.
- Any cracks that do form in the DREA will be rehabilitated as part of the subsidence management measures proposed in the EM plan.
- The residual ponded areas due to subsidence would consist of highly plastic, low permeable clay materials

that would prevent infiltration and mobilisation of salts above rates that occur naturally prior to mining.

- There would not be a hydraulic connection between the surface and the underground workings due to a buffer of over 100 m between the continuous cracking above the Q seam and the base of any surface cracks.
- Subsidence cracking would not give rise to a connection between the underground workings and the shallow ground water layer of weathered and fractured rock, due to a buffer of over 50 m between the continuous cracks and the base of the layer of weathered and fractured rock containing the aquifer.
- If there were a connection (which is not predicted) to shallow groundwater in the layer of weathered and fractured rock, it would lead to a draining of this isolated groundwater patch, with no impact beyond the immediate area.
- The rate of discharge of groundwater from the mine area to the alluvium of the Isaac River is governed by 4 km of undisturbed strata separating the mine from the alluvium and will therefore be the same post-mining as pre-mining.

DERM considers the proponent's response to groundwater issues did not adequately address DERM's requested information and provided evidence to substantiate claims. Further information that was requested included:

- a detailed soil analysis in accordance with the TOR and DERM's information requests that would demonstrate the self sealing ability of soils
- a description of geological structures on site that might have an effect of providing a hydraulic connection between the surface and underground works when taken together with cracking associated with subsidence
- exposure of water to rejects material, drift and shaft spoil including time of exposure and water quality.

The proponent was again advised that the EIS should address the risk of water percolating through the DREA and acting as a source of contaminated water and a motive force for moving that water (contaminated or not) into existing shallow groundwater and surface water in other areas on and off the site. It is known that soil profiles and interburden on site are highly sodic and therefore this aspect taken together with subsidence/cracking and the likely residual lakes on other parts of the site raise the issue of potential land degradation. The EIS should propose an effective groundwater monitoring program to support the necessary mitigation measures. However, in the proponent's response to DERM's outstanding groundwater issues, the proponent provided no further evidence and repeated claims made in the EIS, including:

- Significant seepage to shallow aquifers or soil profiles is not expected to occur because of the very low permeability clay soils (up to 12 m thick) that form the base of the DREA.
- The clayey soil properties will limit crack development due to their plastic and non-brittle nature.
- In the unlikely event that seepage does occur from the DREA to subsurface, it would not contaminate the shallow aquifer which contains poor quality (brackish) water of alkaline pH.
- It is considered highly unlikely that any seepage from the DREA will be able to enter the mine due to the essentially impermeable clay rich soils forming the foundation of the DREA and continuous subsidence cracking connecting to the mine will not extend to the base of the shallow aquifer let alone the base of the DREA.

While that situation may occur, the lack of supporting evidence means there is still some uncertainty. Consequently, the proponent will need to develop a monitoring program to monitor for infiltration of water in the DREA and propose mitigation measures should the DREA system increase the level of the phreatic surface relative to surrounding areas and thereby create a differential hydraulic pressure or 'head' of water between under the DREA and surrounding areas.

The proponent has made a commitment to undertake periodic monitoring of runoff water from, and groundwater down gradient of, the DREA by measuring electrical conductivity and pH in order to validate the predicted benign geochemical nature of the total rejects. If the monitoring program were to indicate that the proposed trigger levels had been reached, the proponent proposes to undertake further monitoring and a geochemical investigation. DERM has advised the proponent that they should include the following amendments to their commitments on groundwater monitoring:

- monitoring a full suite of dissolved metals as mentioned in the recommended water conditions in Appendix 1

- obtaining background data prior to operation of the mine
- undertaking groundwater monitoring at all landowner bores whether or not required by the landowner in addition to the proposed monitoring bores.

Recommended EP Act Conditions

The proposed groundwater conditions in Schedule C – Water of the draft EM plan do not contain all of DERM's standard conditions for groundwater. It is recommended that the draft environmental authority contain conditions C1 to C13 in Appendix 1 of this report. Those conditions require the development and implementation of a groundwater monitoring program that is able to detect a significant change to groundwater quality values including groundwater draw down fluctuations. The conditions require the development of groundwater contaminant trigger levels for a full suite of potential contaminants.

The recommended conditions also require the proponent to develop a program to effectively monitor the water pressure across the base of the DREA at the interface with the natural surface and to provide the means to reduce the water table within the DREA.

3.4.2 Surface water

The site is drained by a number of minor ephemeral drainage lines. The majority of the site drains to the north-east to the Isaac River. The southern section of the site drains to Ripplestone Creek and the upstream tributaries of the creek traverse the southern section of the site before joining the Isaac River approximately 30km downstream of the site. The north-west corner of the site drains to Cherwell Creek which joins the Isaac River to the north of the site. The former Department of Natural Resources and Water confirmed that the western tributary of Ripplestone Creek is the only 'watercourse' on the site, as defined in the *Water Act 2000*.

3.4.3 Surface water contamination

In the EIS, the proponent has identified potential impacts on surface water resources due to the Eagle Downs Project, including:

- contamination of surface water due to runoff from disturbed and undisturbed areas
- discharge of mine water or sewerage effluent.

Also the EIS identified that surface water runoff from the DREA will be unsuitable for uncontrolled discharge from the site, having potentially elevated salinity levels and suspended sediment load. The proponent proposes a management strategy in the EIS to capture the DREA runoff and reuse it for mine water supply.

In order for these potential impacts to be satisfactorily mitigated, the proponent will need to meet their commitments to manage surface water contamination, including:

- operation of the DREA as a nil discharge system
- isolation of the active DREA catchment area diversion drains
- collection of runoff in catch dams and transfer to the mine water dam for use as mine water supply
- discharge of excess water from the mine water dam and, where necessary, in accordance with EA conditions
- use of sediment traps and oil separators to control suspended sediment and any oil spills, prior to collection in dams
- a new sewage treatment facility constructed in accordance with relevant Australian Standards and legislative requirements.

3.4.4 Water management assessment

The EIS states that the project water management system is designed to operate as a 'nil discharge' system. Consequently the proponent assesses that the project will not contribute to any cumulative downstream water quality impacts in the Isaac River. Furthermore, the proponent proposes that in the unlikely event that waste water would discharge from the site during an extreme rainfall event; this would only be conducted in accordance with environmental authority conditions. DERM has reviewed the proponent's proposed water conditions and found that they are consistent with DERM's streamlined water conditions.

However, DERM advised the proponent that the initial mine site water balance study was not sufficiently comprehensive and does not assess the feasibility and viability of all containment structures including the catch dams for the DREA, the mine water dam, subsidence areas, the proposed temporary storages and drainage,

tailings cells and the main dam on site

In response to DERM's issue with the water balance, the proponent highlighted findings in the EIS, including

- the mine having a large annual site water balance deficit that would utilise any storage in the mine water dam prior to the onset of the following wet season
- the site water storage capacity is demonstrably adequate to ensure a very low probability of site discharge, based on conservative assumptions.

However, DERM required more information, and the proponent was advised to undertake a site water balance that is based on conservative assumptions for likely volumetric inputs, appropriate water balance and other hydrological techniques and robust and conservative estimates for inputs. Furthermore, the proponent was advised that the benchmarking of the DSA estimate in documentation should be provided against the 'deciles method' as set out in the former Department of Minerals and Energy guideline, Technical Guidelines for the Environmental Management of Exploration & Mining, 1995.

The proponent then provided an adequate response on water balance issues in the proponent's 'Response to Issues Raised by DERM on 29 January 2010 on the Eagle Downs EIS'. In this response, it concluded that the maximum total DREA catch dam capacity would need to be increased in capacity from 350 ML to 700 ML to ensure nil discharge from these dams. DERM is of the view that an increase in the capacity of the main storage may be required. It is recommended that the EM plan and relevant dam conditions be amended to include this increase in capacity of the catch dams. It is recommended that the draft environmental authority should include conditions that require certified design plans for regulated dams based on more detailed and appropriate hydrologic modelling.

3.4.5 Subsidence impacts on surface drainage

As a result of the sequential long-wall mining of four coal seams, the EIS assessed that the following surface changes are likely to occur:

- Vertical subsidence will develop progressively as a series of troughs on the surface with a maximum cumulative subsidence of about 13 metres
- Tilting areas around the edges of the subsidence troughs with maximum post-mining surface slopes in limited areas of up to 13 per cent over distances of up to 100 metres
- Tension cracks of up to 0.5 metres wide (at the surface) and up to in the order of 15 metres deep are predicted to occur within 35 metres either side of the chain pillars
- Buckling may occur near the centre of the longwall panels due to compressive strain.

Also the EIS identified potential effects of subsidence on surface drainage, including:

- initiation of localised erosion
- localised alteration of surface drainage paths.

The EIS stated that surface drainage patterns would be altered compared to pre-mining. In some areas it will not be possible to re-establish free drainage following subsidence due to the depth of the subsidence troughs. Residual ponding areas will remain in these areas after mining. The proponent advises that the residual ponding areas will cover an estimated maximum total area of approximately 80 ha with the total area affected by mine subsidence will be about 2,900 ha. Furthermore the proponent advised that the residual ponded areas cannot be avoided because of the depth of subsidence (due to mining four coal seams) and the flat topography of the project area.

The proponent has made a commitment to monitoring subsidence effects on a quarterly basis and undertaking remedial drainage, erosion and sediment control works to mitigate these effects.

DERM expressed concern about the ability of the proponent to manage drainage of the DREA via the catch dams while at the same time managing subsidence. The proponent responded to DERM's issues by adding a commitment in the EM plan that the catch dams and diversion drains for the DREA will be proactively managed to ensure that they continue to operate effectively during and after subsidence from each longwall panel. This will be achieved through the development of individual DREA drainage control plans for each longwall panel that would subside any section of the active DREA. The plan for each longwall panel that would subside land under the active DREA will be developed prior to the commencement of mining of that panel. Also in the amended EM plan, the proponent added a commitment on managing subsidence on the DREA by subsequent dumping of fines and spoil material and the regrading of the DREA as part as the ongoing mine operations.

DERM also raised concerns about the impacts due to the residual ponding in subsided areas, including:

- the possibility of increased infiltration rates in the subsided area
- the cumulative impact the ponded areas would have on overland flow.

The proponent was advised by DERM that they should consider the option of backfilling the subsided areas with tailings. However, the proponent advised that backfilling the subsided areas was not feasible for the following reasons:

- Surface subsidence depressions will be formed over the 54 year mine life and it will not be possible to predict the future areas requiring filling with sufficient accuracy to plan a backfilling design.
- Spreading the dry rejects around the site would significantly reduce the post-mining land use as the dry reject dump areas will have a low land use capability and will not be suitable for grazing.
- In order to use rejects material to backfill subsidence troughs, it would be necessary to strip the topsoil and capping material above the subsided areas so that this material could be used in rehabilitation. This would mean that much of the project area would be cleared of vegetation, significantly increasing the ecological impacts of the project. In particular, several hundred additional hectares of endangered Bluegrass would be cleared.
- The option is not economically feasible due to the haulage distances that would be required to transport dry reject material.

DERM accepts that it would not be feasible to backfill the subsided areas. DERM raised concerns that subsidence would cause an increase risk of infiltration of poor quality water percolating through the soil profile into the alluvium during and after operations at the mine. The proponent advised that the risk of increased infiltration of water in the subsided areas is highly unlikely due to the highly plastic, low permeable clay material in the ponded areas that have a self sealing ability

However, DERM considers that the EIS lacked evidence to support the view that these clays soils are present in any significant quantity, that they have low permeability, and that they possess the ability to be self sealing in the circumstances.

Also, DERM raised concerns about the impact the residual voids have on overland flow. In regard to this issue, the proponent advised:

- The residual ponded catchment will result in a small reduction in the effective catchment area and catchment yield of the Isaac River. The effective reduction in the total catchment area of Isaac River is approximately 0.1%. There is no surface water use between the site and the Isaac River and the land use in this area is predominantly grazing. The reduction in catchment area and downstream catchment yield will therefore not adversely impact the local catchment.
- The floodplain, as defined by the 100 year ARI flood level, does not extend into the residual ponding area. It is therefore unlikely that the Isaac River floodwater would enter the residual ponding areas.

DERM considers that the impacts on overland flow from subsidence as a result of mining are acceptable, providing the catchment areas (and therefore the capture of overland flow) are minimised. However, it is recommended that the proponent include in their EM plan an appropriate monitoring and treatment program to address the risks from residual ponding.

The monitoring and treatment program must affectively address the sodic or saline effects on the soil profiles across the site of potential infiltration or shallow migration of water including any contact with overburden.

Furthermore, the proponent will need to meet their commitments made in the EM plan, including

- the progressive re-establishment of free drainage in the subsidence areas be completed, as far as practicable
- diverting runoff from upstream areas away with diversion drains to minimise the impact from residual ponded catchments.

Recommended EP Act Conditions

The proposed conditions in Schedule C – Water in the EM plan are mostly consistent with DERM's streamlined surface water conditions. The following additional and amended water conditions, which are provided in Appendix 1 of this report, should be included in the draft environmental authority:

- sewage effluent conditions W42 to W50

- sediment control condition W51
- regulated dam conditions G1 to G18.

3.5 Land

The EIS was generally adequate with respect to the TOR for land matters.

3.5.1 Soils and Land Capability

The proponent undertook a preliminary soil investigation, based on 44 exploratory drilling locations, aerial photography interpretation (API) and reference to available local and regional soils. DERM considered the intensity of the soil site investigation to be well below that required by the TOR. The terrain analysis study was based mainly on available broad data, API, and a reconnaissance survey for site familiarisation that does not meet the standard required for a soil and land resource assessment for mining projects requiring an EIS.

Until detailed evidence is provided on the soil types, DERM does not accept that there is no class 3 land suitable for cropping with moderate limitations. This applies particularly to the clay soil types.

The proponent was advised through DERM's responses on the EIS, to present more comprehensive information on soils, supported by a higher sampling intensity, and illustrated at an appropriate and accepted mapping scale, such as 1:25 000 to 1:50 000. Furthermore, the proponent was advised that details of the physical and chemical characteristics of the soils are required for mapping the soils, assessing the Agricultural Land Class for Good Quality Agricultural Land, and assessing suitability for topsoil and topsoil stripping depth.

In the EIS, the proponent proposes a future detailed soil investigation to identify the available topsoil stripping depths and topsoil/subsoil management requirements. DERM considered the proposal to defer a soil survey to the site preparation period is not best practice given the importance of soil and subsoil quality and quantity in ensuring rehabilitation success for disturbed areas.

In response to DERM's concerns the proponent provided no further detail on soils and stated that the preliminary soil assessment indicates that there is unlikely to be a shortfall of topsoil resources from within the site with an average of approximately 20 cm of useable topsoil resource together with an additional 20-30 cm of supplementary subsoil available for rehabilitation of disturbed areas.

The proponent added a commitment in their EM plan of preparing a soil stripping plan prior to the commencement of construction of the DREA. Preparation of the plan will include soil sampling in the DREA footprint area and soil testing in order to:

- confirm the quality, location and volumes of DREA capping and topsoils materials
- identify any sodic soils to ensure that they are treated with soil conditioner prior to use in DREA rehabilitation
- develop stripping and stockpiling plans so that topsoil and subsoil quality is maintained and appropriate stockpiling practices are implemented.

DERM's concerns with the soils analysis was again advised to BCCM. However, BCCM provided no new information and repeated their responses made in the 'Response to public submissions' dated August 2009.

DERM considers insufficient evidence has been provided to support the assessment that there is no Class 3 agricultural land on the site, or that the clay soils will self-seal the cracking due to subsidence. Consequently, it is recommended that the EM plan should be amended to commit to a soil sampling program that is agreed with DERM. The program should provide a more detailed analysis of the soils above the subsided areas. A detailed report assessing the results of the soil survey and describing the soil management strategy should be submitted to DERM at least 30 business days prior to the start of construction.

3.5.2 Characterisation of tailings

The EIS mentions that information was acquired from a geochemical assessment of 35 drift and shaft spoil samples as well as 21 representative drill core samples of material likely to be deposited as total rejects to the DREA. These samples were acquired from four drill holes at the project site.

The proponent made the following assessment regarding the waste rock characterisation:

- the rejects material, drift and shaft spoil is likely to be relatively benign and will generate slightly alkaline and fresh (non-saline) runoff and seepage following surface exposure
- on the basis of acid-base testing, net acid generation from the material is unlikely due to the lack of sulfide

- the geochemical characterisation of rejects and of drift and shaft spoil indicated that these materials are sodic and could present surface erosion and dispersion problems.

Through the EIS process, DERM advised the proponent of issues with characterisation of waste rock, including:

- the EIS needed evidence to support the conclusions made on the characterisation or reject and spoil material
- more detailed information was needed in the EIS document on the quantity, as well as the physical and geochemical properties of all tailings and fine rejects.

In response to DERM's concerns the proponent reviewed geochemical test data and highlighted claims made in the EIS, including:

- The concentration of soluble metals and salts in runoff and seepage from these materials was unlikely to present any environmental risk for on site or downstream water quality.
- On the basis of Acid Base Account testing, acid generation from these materials was unlikely due to the lack of sulfide.
- The overwhelming majority of the reject samples have a significant excess of acid neutralising capacity (ANC). Therefore, the drift and shaft spoil and total rejects material, as a whole: would have a significant excess ANC; can be classified as Non-Acid Forming (NAF); and would be expected to continue to generate slightly alkaline runoff and seepage following surface exposure.
- No additional geochemical characterisation of rejects material is warranted apart from periodic monitoring of runoff water from (and groundwater down gradient of) the DREA to validate the benign geochemical nature of the total rejects.

DERM considers the response to submissions did not provide sufficient evidence to adequately support claims made about waste rock characterisation. In particular, the response did not adequately address lag time for chemical reactions and the risk of the system producing acid mine drainage after a long period. Furthermore, the monitoring program of measuring EC and pH is not considered adequate for the early identification and management of any acid generation.

To address DERM's concerns with the characterisation and monitoring of waste rock, it is recommended that the conditions E18 to E19 in Appendix 1 of this report be included in the draft environmental authority. These conditions include the development of a mining waste management plan to ensure that all mining waste is progressively characterised and the development of mine site operational actions for managing any potential acid producing materials.

3.5.3 Dry Rejects Emplacement Area (DREA)

The DREA involves the progressive dumping and spreading of dry rejects. The DREA construction would be similar to an out-of-pit spoil dump constructed by trucks and dozers. It is planned to construct the DREA in a series of 10m high benches, with slide slopes at the natural angle of repose of the material with bench widths designed to facilitate an overall outer slope of 13 per cent. At closure, once all subsidence ceased, the external batters will be dozed to achieve a 13 per cent slope. The top of the DREA will be a maximum of 40 m above the post-subsidence ground surface.

3.5.4 Design and concept of the Dry Rejects Emplacement Area (DREA)

DERM considers the design and concept for the DREA has not been adequately presented in the submitted EIS. Drawings submitted during the EIS process do not adequately detail the DREA structures including catch dams, drains, berms and lifts to demonstrate feasibility of the DREA design. The EIS has not provided sufficient evidence for DERM to have confidence that the DREA will shed water as predicted, or that soils below the DREA will 'self seal' surface cracking due to subsidence as predicted. If the DREA does not perform as predicted, this could result in potential contamination of soil profiles and land via infiltration or migration of water from below the DREA.

In order to address concerns with the design, concept and operation of the DREA, it is recommended that conditions E1 to E7 in Appendix 1 of this report be included in the draft environmental authority. These conditions require the development of an operational plan to be submitted to DERM for review that would include a description of landform development stages of the spoil disposal facility and the placement techniques for spoil and waste material from the coal handling preparation plant.

3.5.5 Operation and management of the DREA

The arrangements in the EIS, for the open placement of rejects and tailings on the DREA are based on the assumption that the process would consistently produce stable, non-flowable material. The submitted EIS does not provide adequate discussion of contingency arrangements in the event that the process does not consistently perform as anticipated. The proponent mentioned in their response to submissions that the EIS does not include discussion of contingency arrangements because of the high level of confidence in this proven technology. DERM expressed concerns that the fine reject waste may be flowable and that adoption of this process in other mines had not always been successful.

The proponent then stated that in the event that dry, stable, non-flowable rejects cannot be produced, an alternative arrangement would be developed and approved by the administering authority prior to commencement. However, no alternative arrangement was initially considered and discussed in the EIS.

In response to DERM's concern, the proponent added the following commitment in their EM plan:

- Fine rejects will be dewatered in a belt filter press (to approximately 70 per cent solids by weight) and combined with the coarse rejects for dry disposal in a DREA. Fine rejects are anticipated to comprise approximately 26.5 per cent by weight of the combined rejects. The moisture content and proportion of fine rejects will be tested on a monthly basis to ensure that the combined rejects material complies with the DREA design requirements and is not 'free flowing'.

DERM advised the proponent that a critical problem is that if the fines content of rejects is not as expected, and/or the dewatered waste material is flowable or potentially flowable, then the DREA will not operate effectively. The proponent was advised to re-consider alternatives should the rejects waste be flowable.

In response, the proponent proposed alternatives that could be used if the rejects waste proves to be flowable. The proponent proposes to build a tailings storage facility (TSF) for the storage of ultra fines should the system produce a fines waste that is flowable. This option includes three potential sites on which to build a TSF. Should a TSF be required for the mine, the proponent will seek separate approvals from DERM to allow its construction.

DERM requires the EM plan to be amended to address the potential situation in which the CHPP would produce flowable waste material, including the deposition of such material in a regulated TSF.

It is recommended that the draft environmental authority contain the conditions in sections E and G of Appendix 1 of this report. Those conditions address the management of both flowable and non-flowable rejects waste.

3.5.6 Rehabilitation of DREA

DERM advised the proponent that the Department does not favour of the DREA remaining un-rehabilitated for long periods of time until all subsidence on site ceases. In response to DERM's concern, the proponent advised that there is no feasible alternative to the proposed DREA location and rehabilitation plan as there is very limited land available within the mining lease application area that will not be subsided. The proponent advised that the DREA area is limited to 385 ha, developed over 50 years that would be readily rehabilitated within a short timeframe following completion of subsidence.

Furthermore the proponent advised that they considered a range of environmental factors in relation to the DREA and no environmental impacts were predicted that would necessitate progressive rehabilitation of the DREA. The environmental factors that were considered in relation to the DREA included: deterioration of downstream water quality, groundwater contamination, geochemistry, dust emissions, noise and visual impacts.

The final rehabilitated DREA will be an elevated dump that is re-vegetated for erosion control and long term stability. Due to the need to maintain the long term vegetation cover it will not be suitable for agricultural land after mining.

The proponent makes the following commitments for rehabilitating the DREA:

- capping of rejects with one metre of subsoil and 0.25 m of topsoil
- reshaped outer slopes at a grade of 13 per cent with a maximum effective slope length of 100 m
- top surface grade of two per cent
- contour mapping and installation of contour drains
- establishment of appropriate native shrubs, legumes and grass species.

The proponent has made a commitment in their EM plan to conduct rehabilitation trials at the southern end of the DREA during the active mine life. This area will not be subject to subsidence and so it is possible to

undertake trials in this limited area during the mine life. The trials will be used to confirm the adequacy of the rehabilitation strategy proposed above and will also specifically include:

- confirmation of the effectiveness of the capping layer as an effective growth medium
- confirmation of the stability of the proposed rehabilitation slope and erosion control measures
- confirmation of the effective treatment of sodic soils and subsoils
- treatment of any sodic material used as a cover layer or as topsoil with a soil conditioner, such as dolomite, to restore the ionic balance.

DERM considers the proponent's trial is an acceptable approach that will allow the proponent to demonstrate the proposed rehabilitation strategy can be achieved.

3.5.7 Rehabilitation of subsided areas

The proponent has made commitments to monitor subsidence effects on a quarterly basis and undertaking remedial drainage, erosion and sediment control works where necessary. Remedial works may include the following:

- stabilisation works including cross ripping and installation of contour drains to remediate any steepened areas prone to erosion
- rehabilitation of surface cracks by ripping/ploughing or excavating and backfilling, and reseeded
- repair of surface buckling by grading and re-spreading excess material and reseeded
- remedial drainage earthworks to redirect drainage paths
- cut and/or fill earthworks to re-establish free drainage in depression/ponding areas.

Furthermore, the proponent proposes to develop a Rehabilitation Management Plan (RMP) in accordance with proposed conditions in the EM plan. The RMP will address the following aspects:

- landform design criteria including a conceptual end of mine landform
- rehabilitation methods
- spoil characterisation, topsoil analysis and topsoil management
- revegetation
- rehabilitation monitoring and success criteria.

The RMP will address the rehabilitation of the slopes and plateaus of the DREA, surface subsidence areas and infrastructure areas.

The above commitments to manage and rehabilitate subsided areas are considered adequate for the project.

Recommended EP Act Conditions

The proposed rehabilitation conditions in Schedule F – Land of the draft EM plan do not contain all of DERM's standard conditions. It is recommended that the draft environmental authority contain conditions F1 to F19 in Appendix 1 of this report. The additional conditions include: the requirement for developing rehabilitation landform criteria; undertaking progressive rehabilitation, where possible; completing an assessment report by a registered Professional Engineer of geotechnical issues and erosivity of the proposed final landform; conducting a rehabilitation monitoring program; and developing a post closure management plan.

3.6 Nature conservation

3.6.1 Impact on vegetation communities

The EIS identified potential impacts on vegetation communities, including:

- clearing of vegetation for the construction of mine infrastructure and the Dry Rejects Emplacement Area (DREA)
- clearing of small areas of vegetation to enable rehabilitation of surface subsidence effects including surface cracks and buckling, remedial surface drainage, cut and fill earthworks
- temporary inundation of vegetation due to residual ponding areas.

The project will require the disturbance of 644 ha of non-remnant vegetation and 777 ha of remnant vegetation, including 583 ha of endangered regional ecosystems (REs), 6 ha Of Concern REs and 188 ha Not of Concern REs. This represents the disturbance of approximately 27 per cent (2901ha) of remnant vegetation within the mining lease (ML) area. The regional ecosystems within the project area to be cleared are detailed in Table 1.

Poplar Box Woodland is an RE listed as Of Concern under the *Vegetation Management Act 1999* (VM Act). Approximately 4 ha will be disturbed for subsidence rehabilitation. This will result in the loss of small areas of Poplar Box Woodland which is already highly disturbed. However, the proponent assesses that this will not adversely affect the local occurrence of this species. The project is not expected to remove or substantially modify habitat for this RE.

The remaining issues relating to the removal of vegetation are covered by the controlling provision for this project under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) as well as by the provisions of the Environmental Authority under the EP Act. Impacts on vegetation communities are covered in detail in section 3.7, Matters of National Environmental Significance, of this EIS assessment report.

3.6.2 Impacts on individual species of flora and fauna

No threatened flora species listed under the *Nature Conservation Act 1992* (NC Act) were found in the ML area during the field surveys.

Square-tailed kite (*Lophoictinia isura*)

The square-tailed kite (Rare under the NC Act) was seen flying near a survey site. However, due to its large home range this species would use most of the ML area in search for food. No roosting or nesting sites were found during field surveys within the proposed mining lease.

Little pied bat (*Chalinolobus picatus*)

The little pied bat (Rare under the NC Act) was found in the ML area foraging along the creek line within the Brigalow woodlands (RE 11.9.5 and 11.4.9) and at the dam. Some disturbance is anticipated to occur to the habitat of the little pied bat as a result of subsidence related impacts.

A proposed offset for the clearing of brigalow will provide additional habitat for the little pied bat.

3.6.3 Impacts on aquatic biology

The EIS states that there are no permanent or significant aquatic habitats available within the ML area. Only a few ephemeral creek lines are present which contained water after rain events during the wet season in early 2008.

The aquatic biology surveys conducted, identified five native fish species and one freshwater crab species present within the ephemeral creeks. All fish species were common species.

The surface area affected by mine subsidence does not include any significant creeks or waterways. Surface subsidence will therefore not impact significantly on any pre-mining aquatic habitat.

3.6.4 Impacts on habitat corridors

No habitat corridors of significance were identified within the ML area by the Brigalow Belt Biodiversity Planning Assessment (EPA, 2008). However, Riparian/Regional and State habitat corridors were identified to the north west of the ML area along the Isaac River and to the south east of the ML area commencing at Ripplestone Creek. These habitat corridors will not be disturbed by the project and will continue to provide significant riparian corridors for biodiversity continuity. A terrestrial corridor of state significance was also identified in the Brigalow Belt Biodiversity Planning Assessment to the west of the ML area. This terrestrial corridor will not be disturbed by the project and will continue to provide a significant corridor to maintain biodiversity continuity in the region.

Table 1 Regional ecosystems represented in vegetation at the Eagle Downs Project

RE Code	Description	Status under VM Act	Status under the EPBC Act	Area to be cleared (ha) ¹
11.9.5	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on Cainozoic fine-grained sedimentary rocks.	Endangered	Endangered	21.4
11.4.9	<i>Acacia harpophylla</i> shrubby open forest with <i>Terminalia oblongata</i> on Cainozoic clay plains.	Endangered	Endangered	9.5
11.9.3/11.9.2 (70/30)	Grassland dominated by <i>Dichanthium sericeum</i> and/or <i>Astrelba spp.</i> On fine-grained sedimentary rocks and <i>Eucalyptus melanophloia</i> (silver leaved ironbark) grassy woodland to open woodland on fine-grained sedimentary rocks with or without <i>E.orgadophila</i> .	Not of Concern	Endangered/ Not Listed	92.8
11.9.3/11.9.2 (50/50)	Grassland dominated by <i>Dichanthium sericeum</i> and/or <i>Astrelba spp.</i> on fine-grained sedimentary rocks and <i>Eucalyptus melanophloia</i> (silver leaved ironbark) grassy woodland to open woodland on fine-grained sedimentary rocks with or without <i>E.orgadophila</i> .	Not of Concern	Endangered/ Not Listed	12.0
11.9.2/11.9.5 (90/10)	<i>Eucalyptus melanophloia</i> (silver leaved ironbark) grassy woodland to open woodland on fine-grained sedimentary rocks with or without <i>E.orgadophila</i> .	Not of Concern /Endangered	Not Listed/ Endangered	3.8
11.9.2/11.9.3 (70/30)	<i>Eucalyptus melanophloia</i> (silver leaved ironbark) grassy woodland to open woodland on fine-grained sedimentary rocks with or without <i>E.orgadophila</i> and Grassland dominated by <i>Dichanthium sericeum</i> and/or <i>Astrelba spp.</i> on fine-grained sedimentary rocks.	Not of Concern	Not Listed/ Endangered	330.8
11.8.13	Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks.	Endangered	Endangered	0.8
11.8.11/11.8.5 (70/30)	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks and <i>Eucalyptus orgadophila</i> (mountain coolibah) open woodland on igneous rocks.	Of Concern/ Not of concern	Endangered/ Not Listed	5.3
11.8.11/11.3.2 (90/10)	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks and <i>Eucalyptus populnea</i> woodland on alluvial plains.	Of Concern	Endangered/ Not Listed	28.9
11.8.11	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks.	Of Concern	Endangered	78.0
11.3.2/11.3.7 (90/10)	<i>Eucalyptus populnea</i> woodland on alluvial plains and <i>Corymbia spp.</i> (bloodwoods) woodland on alluvial plains on sandy soils.	OC/ Not of Concern	Not Listed	5.7
11.9.2	<i>Eucalyptus melanophloia</i> (silver leaved ironbark) grassy woodland to open woodland on fine-grained sedimentary rocks with or without <i>E.orgadophila</i>	Not of Concern	Not Listed	45.3
11.8.5	<i>Eucalyptus orgadophila</i> (mountain coolibah) open woodland on igneous rocks.	Not of Concern	Not Listed	66.0
11.5.3	Shrubby woodland with <i>Eucalyptus populnea</i> (poplar box) and/or <i>E. melanophloia</i> (silver leaved ironbark) and/or <i>Corymbia spp.</i> (bloodwoods) on sand plains.	Not of Concern	Not Listed	74.8
11.3.7	<i>Corymbia spp.</i> (bloodwoods) woodland on alluvial plains on sandy soils.	Not of Concern	Not Listed	1.7
	Remnant vegetation			776.8
	Non-remnant vegetation			643.8
	Total vegetation			1420.6

¹ Source: Eagle Downs EIS, table 9, Appendix H Flora & Fauna

3.7 Matters of National Environmental Significance

The controlling provisions for the Eagle Downs Project are sections 18 and 18A (Listed threatened species and communities) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The relevant listed ecological communities are Brigalow (*Acacia harpophylla* dominant and subdominant communities), Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (formerly listed as Bluegrass (*Dichanthium spp*) dominant grasslands of the Brigalow Belt Bioregions) and Semi-evergreen vine thickets of the Brigalow Belt. The relevant listed species is the ornamental snake (*Denisonia maculate*).

3.7.1 Impact on vegetation communities

Brigalow (*Acacia harpophylla* dominant and subdominant communities)

The Brigalow (*Acacia harpophylla* dominant and subdominant communities) (Brigalow) is listed as an endangered ecological community under the EPBC Act. Brigalow was identified within two remnant REs (RE 11.4.9 and RE 11.9.5) in the ML area. These communities were observed to be heavily grazed with severe dieback present in most areas. In particular, canopy dieback in RE 11.9.5 was extensive and a large proportion of the majority of Brigalow was dead. Weeds such as parthenium and the introduced buffel grass were moderately common and most areas were dissected by tracks or in close proximity to tracks.

The project would disturb approximately 31 ha of poor quality Brigalow as a result of subsidence related impacts and establishment of surface infrastructure. This is equivalent to a loss of 0.03 per cent of both RE 11.9.5 and RE 11.4.9 respectively from the remaining areas in the Brigalow Belt Bioregion.

Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin

The Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin ecological community (Bluegrass) are listed as an endangered ecological community under the EPBC Act. Approximately 945 ha of Bluegrass was identified within RE 11.8.11 and RE 11.9.3 across the ML area.

The Bluegrass community was observed to be heavily grazed, with most areas showing degradation or fragmentation by tracks. Weeds such as parthenium and buffel grass were moderately common and in the dry season represented up to 50 per cent of ground cover. The project will significantly disturb 140 ha of Bluegrass community through clearing in the footprint of the infrastructure and the DREA and the Bluegrass that will be lost due to being in areas that will pond following subsidence.

Semi-evergreen Vine Thicket Ecological Community

The Semi-evergreen vine thicket of the Brigalow Belt ecological community (Semi-evergreen vine thicket) is listed as an endangered ecological community under the EPBC Act.

Approximately 2.7 ha of Semi-evergreen vine thicket was identified as an isolated occurrence within RE 11.8.13.

The project will disturb 0.8 ha of Semi-evergreen vine that equates to a disturbance of 0.02 per cent of mapped Semi-evergreen vine thicket within the Brigalow Belt Biodiversity Planning Assessment bioregion. The remainder of the isolated occurrence of the semi-evergreen vine thicket community that would not be impacted by the project will be managed and monitored by the proponent.

3.7.2 Impacts on listed species of flora and fauna

No threatened flora species listed under the EPBC Act were found in the ML area during the field surveys.

The majority of fauna species identified within the ML area were common. No migratory or marine bird species were identified in the ML area during the field surveys.

Ornamental Snake (*Denisonia maculate*)

An ornamental snake (listed as vulnerable under NC Act and EPBC Act) was found in Brigalow woodland (RE 11.4.9) on deep cracking clays (Survey Site 2a; Figure 14-1 of the EIS). The habitat where the ornamental snake was found will not be impacted by the project.

The proposed Brigalow offset will provide additional habitat for the ornamental snake.

An assessment of significance was prepared for this species within the EIS and the assessment found that the project is not expected to cause a significant impact on this species.

3.7.3 Mitigation measures

The proponent has provided adequate commitments in their EM plan to avoid, mitigate and offset impacts of the

mining project on matters of national environmental significance, including:

- clearing remnant vegetation in accordance with the clearing procedure outlined in the EM plan that is designed to minimise the impact of the project on ecological values
- undertaking subsidence rehabilitation work in accordance with the rehabilitation management plan that will include the rehabilitation of impacted Bluegrass
- implementing the weed and feral animal control program
- proposing offsets (see below) for the loss of 31 ha of Brigalow and 140 ha of significantly disturbed Bluegrass in accordance with the DEWHA's Draft Policy Statement: Use of Environmental Offsets Under the *Environment Protection and Biodiversity Conservation Act 1999*.

The clearing procedures will ensure that any clearing of remnant vegetation will be restricted to the minimum necessary to enable the safe construction, operation and maintenance of the project. Also the clearing procedures have measures to deal with any encountered threatened species under the EPBC Act and NC Act. These measures include obtaining any necessary permits under the NC Act for relocating any threatened species.

DERM is satisfied that the information presented in the EIS provides a suitable assessment of the significance of the potential impacts of the project on nature conservation and matters of national environmental significance, especially the listed threatened species and communities under the EPBC Act.

Offsets

DERM and the Department of the Environment, Water, Heritage and the Arts (DEWHA) required the proponent to provide offsets for the loss of Brigalow and Bluegrass. In response, the proponent proposed the following offsets:

- For Brigalow, the proponent is currently further developing the option of rehabilitating degraded Brigalow areas within the project area as an offset. The proponent proposes to develop a management plan for this offset area, which would be approved by DEWHA prior to any clearing of Brigalow. Landowner approval for any management measures, including fencing, would be obtained prior to submission of the plan for approval. Longterm protection arrangements will need to be identified and confirmed.
- For Bluegrass, the proponent has engaged Ecofund to prepare a Bluegrass Environmental Offset Strategy. Further details of the offset are still being developed. Once a suitable Bluegrass offset has been located, the proponent will develop a management plan for the Bluegrass offset and the plan will be subject to approval by the DEWHA prior to the clearing of Bluegrass.

It is recommended that the proponent include options in the EM plan should they be unable to find a suitable offset for Bluegrass.

Recommended EP Act Conditions

It is recommended that the draft environmental authority contain the conditions H1 to H3 in Appendix 1 of this report. These include requirements for the development of an offsets package and a weed management plan.

DEWHA will develop conditions to be applied to their approval during the next stage of their process under the EPBC Act.

3.8 Road Infrastructure and Transport

The EIS was generally adequate with respect to the TOR regarding road infrastructure and transport.

The EIS identified and considered transport issues for the project, including:

- road traffic generation during the construction and operational phases of the project
- existing and predicted future road traffic volumes on the Peak Downs Highway, Winchester Road and Moranbah Access Road
- road safety on the Peak Downs Highway and Winchester Road in the vicinity of the project and at the intersections of the Eagle Downs Mine Access Road with Winchester Road
- the increase in coal freight traffic on the existing Goonyella Rail System and Norwich Park Branch Railway Line
- the increase in coal volume to be handled at coal terminals at Queensland ports.

Queensland Police Services (QPS) raised a number of transport issues that were mostly addressed through the proponent's responses and additional commitments in the EM plan. However, at the time of writing, QPS and the proponent have not resolved issues related to wide load movements and the upgrade of the QPS radio network coverage on roads used by project-related traffic. DERM is unable to impose conditions on the environmental authority to deal with these issues. Consequently, it is recommended that the proponent continue to liaise with QPS regarding issues with the project's impact on police resources.

The EIS indicated that the project related traffic will give rise to road pavement impacts on the Peak Downs Highway and impacts on the intersections between the Peak Downs Highway and Winchester Road and the Peak Downs Highway and the Moranbah Access Road. The proponent has made a commitment to provide monetary contribution for pavement impacts and intersection upgrades arising from the project. The issue of determining a contribution towards road impacts was discussed at a meeting with the Department of Transport and Main Roads (DTMR) and the proponent whereby it was agreed that DTMR was to approach the Department of Infrastructure and Planning (DIP) to enquire as to its willingness to coordinate a study to determine the cumulative traffic impacts from the various mines and mining projects that have a potential cumulative impact on the project's road network. This study would ensure that there is consistency in the way in which traffic impacts are assessed to enable costs for any impacts to be equitable apportioned between the mining projects contributing to the impacts. The proponent is willing to pay an equitable share of the reasonable costs of such a cumulative study and will cooperate fully with the study. It is recommended that the proponent continue to liaise with DTMR regarding participation in any cumulative study on road and transport impacts from mining projects.

DTMR is generally satisfied with the proponents proposed intentions to provide for suitable resolutions of traffic issues. However, DTMR consider further consultation is required regarding a number of significant issues associated with the following:

- reviewing and finalising the road impact assessment to determine fair intersection upgrade and maintenance contributions associated with project traffic
- reporting the findings in a Road-use management Plan (RMP) including detailed commitments to address road impacts of project traffic.

Recommendations

It is recommended that the proponent continue to liaise with the Corridor Land Management & Operations unit of DTMR to discuss and resolve the outstanding issues associated with the project. In order to address outstanding issues, the proponent is required to undertake the following work:

Road Impact Assessment and Management Plan

Within three months of the EIS Assessment Report being issued, and prior to the commencement of any construction for the project, the proponent shall:

- Review and finalise the road impact assessment (RIA) that includes details of all project transport impacts on the safety and efficiency of state-controlled roads in accordance with Guidelines for Assessment of Road Impacts of Development (DMR, 2006), and the methodology outlined in the Notes for Contribution Calculations prepared by the former MR Central District in consultation with the Manager of DTMR Mackay Regional Office, then submit the RIA to the Manager DTMR Mackay Office for review and approval.
- Prepare a road-use management plan (RMP) for all use of state-controlled and other roads for each phase of the project. The RMP will detail traffic volumes, proposed transport routes, required road infrastructure maintenance and/or upgrades to mitigate road impacts, any necessary conditions about access/connection to public roads, transport scheduling, dust control and road safety. The RMP is to include arrangements to ensure compliance with the management of workforce movements associated with the project. For example, the proponent should achieve the committed level of bus travel, otherwise traffic impact assessments and mitigation strategies must be reviewed. DTMR must approve the plan prior to implementation.
- Contribute towards any necessary upgrade or improvement works to the Moranbah Access Road/Peak Downs Highway and Winchester Road/Peak Downs Highway intersections (both are proposed Seagull treatments with extensions to the acceleration lanes which meet DTMR requirements) and any necessary road maintenance contributions identified in the finalised RMP to ameliorate impacts of project traffic.
- Provide at no cost to DTMR any immediate road safety upgrade works identified as part of the RMP which are required, such as amelioration measures at the affected intersections to accommodate construction generated traffic.

- Prior to undertaking any works, obtain the relevant licenses and permits under the *Transport Infrastructure Act (Qld) 1994* for works within the State-controlled road corridor.

Proposed Traffic Management Plan

Within two months of appointing a construction contractor for the project, and prior to the commencement of any significant construction works on the project, the proponent shall prepare detailed drawings and a Traffic Management Plan (TMP) for any construction and other activities in the state-controlled road corridor.

The proponent shall present detailed drawings and the TMP for review by DTMR, the Queensland Police Service and Isaac Regional Council as appropriate and take account of their reviews.

The proposed TMP shall incorporate a provision that, prior to commencing any program of oversize transport movements that may be required for the construction and operation of the project, the proponent will consult with DTMR, the Queensland Police Service and Isaac Regional Council.

The proponent shall obtain the necessary permits for any excess mass or over-dimensional loads associated with the project as required under the *Transport Operations (Road Use Management) Act (Qld) 1995*.

The proponent shall implement the TMP during construction and commissioning of the project and any construction of access road intersection/s.

Proposed Infrastructure Agreement

The proponent shall enter into an Infrastructure Agreement with DTMR for any contribution towards upgrading affected intersections or maintaining State-controlled roads as a result of significant project traffic impacts as calculated in the finalised RMP and agreed upon with DTMR Mackay Regional Office.

Cumulative Study on Road and Transport Impacts

The proponent shall participate in a cumulative study with DTMR on road and transport impacts from mining projects.

Queensland Police Resources

The proponent shall liaise with the Queensland Police Service regarding issues with the project's impacts on police resources including wide load movements and the QPS radio network coverage on roads.

3.9 Social Impacts

The EIS generally addressed the TOR on social impacts. The social impacts addressed by the proponent include impacts on:

- housing demand and supply,
- community infrastructure and services; and
- social implications of the project workforce accommodation arrangements.

Mine construction is anticipated to commence in the second half of 2010 and continue for a period of five years. The construction workforce starts with 90 persons, peaks in the year 2011 with 360 and finishes with 60. The project will employ 420 persons in 2014 with the commencement of the first longwall. The workforce will increase to 570 persons following the commencement of the second longwall in 2017.

The proponent assesses that the project will contribute to existing cumulative social issues, which are a result of the recent expansion in the mining industry in the Bowen Basin and in particular the increase in mining projects around Moranbah. These existing social issues include:

- provision of housing and accommodation
- access to community services and facilities
- local community identity and vitality
- labour force and skill shortages.

In regard to the housing of workers, the proponent is planning to accommodate 100 per cent of the construction workforce in work camps. During the operational phase, it is planned that 25 per cent of the workforce will reside in residential dwellings and 75 per cent in single persons quarters (SPQs). The proponent is planning to provide assistance to those workers wanting to live in Moranbah through rental schemes and house buying schemes.

The Department of Infrastructure and Planning (DIP) is the lead agency on the assessment of social impacts.

DIP advised that they have concerns that the proponent's strategy of relying heavily on SPQs does not sufficiently take into account the associated cumulative social impacts on local and regional family and social values, social infrastructure and demographic issues.

DIP advised that the proponent's response to the concerns raised by government agencies and other stakeholders was limited to a general commitment to collaborate on a future accommodation strategy development. This strategy is based on consultation with all stakeholders and reflects the opportunities presented in the local housing market, labour market and economy at the time. The proponent's only specific measure proposed to progress these strategies is the development of a community consultation management plan that encompasses development of the project accommodation strategy, and the monitoring and management of stakeholder concerns and issues during construction and operations. DIP recommends that the proponent's commitment to a community consultation management plan should be strengthened by seeking the proponent's agreement to use this initiative as a vehicle for the development of action plans in partnership with the community. DIP recommends that to strengthen the commitment to community consultation, the proponent should include the following purpose in their community consultation plan:

- The development of action plans that: enhance local and regional community and business development opportunities and initiatives arising from the project; respond to social, cultural and community priorities that are progressively identified through community engagement processes across the life cycle of the project; and provide a formal mechanism for grievance handling, review, monitoring and public reporting on social impact mitigation.

In response to DIP's above recommended commitment of enhancing "local and regional community and business development opportunities and initiatives arising from the project", the proponent added a commitment to their EM plan, of developing an industry participation policy that will detail the level of local industry participation. However, DIP advised that this proposal did not go far enough. The industry participation policy outlined by the proponent will partially address DIP's concern. However, it is recommended that the proponent meet DIP's request of providing local and regional community action plans and strategies that go beyond a business/industry focus and deal with the maintenance of community well being and address social changes brought about by the project.

The proponent has amended their EM plan to include the development of a community consultation management plan that would ensure that social, cultural and community priorities related to the project are progressively identified over the life of the project and appropriate responses are determined in consultation with the community, the local council and state advisory bodies. However, DIP advise that this response could be strengthened by having a project community liaison group to exchange information and build collaborative relations with business and communities at local and regional levels.

It is recommended that the proponent include a commitment to establish and financially support an independent project community liaison group (CLG) as a formal mechanism for information exchange and community engagement with local and regional communities. The CLG would:

- comprise representatives from the local chamber of commerce, community and service organisations, indigenous groups, Isaac Regional Council, mine management and relevant government agencies such as Department of Communities
- have a terms of reference endorsed by community groups who are represented on the CLG
- exist for the life of the project
- monitor and report on stakeholder issues
- advise the proponent on project related matters including but not limited to:
- accommodation strategy
- housing affordability
- road safety
- cumulative impacts (social and business)
- strategies to meet employment targets
- complaints management
- action plans for community and business opportunities
- monitoring and public reporting

- developing and implementing the community consultation management plan.

Furthermore it is recommended that the proponent add the underlined text to the following commitment:

“The proponent will participate in and collaborate with local and regional stakeholder groups by establishing and supporting a project community liaison group (CLG) and by engaging with groups such as the Bowen Basin Local Leadership Group regarding cumulative impact management as well as matters raised at the CLG.”

DIP advise that the proponent’s amended EM plan does not address their recommendation that the community consultation plan include indigenous representation to ensure an inclusive approach to project communication and community relations is realised. The CLG, proposed above, has an indigenous representative. However, in the event the CLG’s does not attract indigenous involvement, other mechanisms for consultation with indigenous groups should be implemented to ensure an inclusive approach to project communication and community relations is realised.

Recommendations

Local and regional community action plans

It is recommended that the proponent meet DIP’s request of providing local and regional community action plans and strategies that go beyond a business/industry focus and deal with the maintenance of community well being and address social changes brought about by the project.

Independent project community liaison group (CLG)

It is recommended that the proponent establish and financially support an independent project CLG as a formal mechanism for information exchange and community engagement with local and regional communities.

Recommended EP Act Condition

DERM recommends condition I1 in Appendix 1 of this report should be included in the draft EA.

4 Recommendations for conditions for any approval

DERM has developed a set of conditions known as the streamlined conditions that form the basis set from which a draft environmental authority may be developed for a particular level mining project. It is recommended that the streamlined conditions should be included in the draft environmental authority except where this report recommends that those conditions should be added to or amended. In particular, it is recommended that the conditions provided in Appendix 1 of this report should be included in the environmental authority for the project.

However, while section 59 of the EP Act states that this EIS assessment report must recommend any conditions on which any approval required for the project may be given, section 202 of the EP Act states it is the purpose of the submitted EM plan to propose environmental protection commitments to help the administering authority prepare the draft environmental authority for the application. As the submitted EM plan is not yet adequate and must be revised and resubmitted, there was insufficient information for this EIS assessment report to be able to make full recommendations for specific conditions. The environmental authority will be drafted after the proponent has submitted a satisfactory EM plan.

5 Adequacy of the EM plan for the project

A draft EM plan was included with the draft EIS that was released for public notification. A number of submissions on the draft EIS raised issues that required amendments to the draft EM plan and many of these amendments were agreed to by BCCM in the amended EM plan. DERM has reviewed the amended draft EM plan provided by BCCM but considers that the recommendations outlined in this EIS assessment report must be incorporated into the EM plan before the document would be acceptable. A revised EM plan that satisfactory addresses the recommendations of this assessment report must be provided before the decision will be made to allow the application to proceed to the draft EA stage.

The revised EM plan, which must meet the content requirements of s203 of the EP Act, must be resubmitted for assessment before the decision under s207 is made on whether to allow the application to proceed to the draft environmental authority stage.

6 Suitability of the project

DERM has considered the final TOR, the submitted EIS, all submissions on the submitted EIS, and the standard criteria. Despite some areas where the TOR was not fully addressed, the submitted EIS and supplementary information have not identified impacts of sufficient magnitude to prevent the project from proceeding. However, the recommendations of this EIS assessment report and EM plan assessment report should be fully

implemented.

Disclaimer:

While this document has been prepared with care it contains general information and does not profess to offer legal, professional or commercial advice. The Queensland Government accepts no liability for any external decisions or actions taken on the basis of this document. Persons external to the Department of Environment and Resource Management should satisfy themselves independently and by consulting their own professional advisors before embarking on any proposed course of action.

Approved By

Stuart Cameron

Signature

Stuart Cameron
Director, Environmental Impact Assessments
Department of Environment and Resource
Management

2 June 2010

Date

Enquiries:
Peter Blumke
EIS Coordinator
Ph. 1300 130 372
Fax. (07) 3330 5634

Appendix

Proposed EA Conditions – Schedule B: Air

- B2** When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), dust and particulate monitoring must be undertaken, and the results thereof notified to the administering authority within fourteen (14) days following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place. Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); and
 - b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with:
 - i) Australian Standard AS 3580.9.6 of 2003 (or more recent editions) Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet - Gravimetric method; or
 - ii) Any alternative method of monitoring PM10 which may be permitted by the current edition of the Air Quality Sampling Manual as published from time to time by the administering authority.

Proposed EA Conditions: Schedule C – Water

Groundwater

- C1** The holder of the environmental authority must develop and implement a groundwater monitoring program by **commencement of production mining**.
- C2** The program must be able to detect a significant change to ground water quality values (consistent with the current suitability of the groundwater for domestic and agricultural use) due to activities that are part of this mining project.
- C3** The program must effectively monitor the water pressure across the base of the DREA at the interface with the natural surface and provide the means to reduce the phreatic surface within the DREA.
- C4** The holder of the environmental authority must report the results and analysis of groundwater monitoring to the administering authority on request.
- C5** Subject to condition **C6** groundwater levels must be monitored and groundwater draw down fluctuations in excess of two (2) metres per year, not resulting from the pumping of licensed bores, must be notified as per conditions **A7 – A11**.
- C6** Groundwater affected by the mining activities must be monitored at the locations and frequencies defined in Schedule C – Table 1 (Groundwater monitoring locations and frequency) and as shown in Figure 1 (Surface and Groundwater monitoring Locations).

Schedule C – Table 1 (Groundwater monitoring locations and frequency)

Monitoring Point	Easting (GDA 94)	Northing (GDA 94)	Monitoring Frequency
MB1	623253.87	7551540.88	Quarterly
MB2	623683.79	7549391.23	Quarterly
MB3	3627240.40	37549946.32	Quarterly

MB4	626507.48	7544152.18	Quarterly
MB5	628490.55	7542693.29	Quarterly
[Additional monitoring]	[To be amended in accordance with conditions C1 – C3]	[To be amended in accordance with conditions C1 – C3]	[To be amended in accordance with conditions C1 – C3]
Landowner Bore 8	623797	7552173	Quarterly
Landowner Bore 11	627210	7546907	Quarterly
Landowner Bore 13	627200	7546952	Quarterly

C7 If the groundwater contaminant trigger levels defined in Schedule C – Table 2 (Groundwater contaminant trigger values) are exceeded then the environmental authority holder must complete an investigation into the potential for environmental harm and notify the administering authority within **twenty-eight (28)** days of receiving the analysis results.

Schedule C – Table 2 (Groundwater contaminant trigger values)

Water Quality Indicator	Unit	Trigger Values
Aluminium	µg/L	To be provided as per condition C8
Antimony	µg/L	To be provided as per condition C8
Arsenic	µg/L	To be provided as per condition C8
Calcium	µg/L	To be provided as per condition C8
Chlorine	µg/L	To be provided as per condition C8
CO3	µg/L	To be provided as per condition C8
Dissolved Solids (Total)	µg/L	To be provided as per condition C8
Electrical Conductivity	µS/cm	To be provided as per condition C8
HCO3	µg/L	To be provided as per condition C8
Iron	µg/L	To be provided as per condition C8
Magnesium	µg/L	To be provided as per condition C8
Mercury	µg/L	To be provided as per condition C8
Molybdenum	µg/L	To be provided as per condition C8
Petroleum Hydrocarbons (Total)	µg/L	To be provided as per condition C8
pH	pH Units	To be provided as per condition C8
Potassium	µg/L	To be provided as per condition C8
Selenium	µg/L	To be provided as per condition C8
Silver	µg/L	To be provided as per condition C8

SO4	µg/L	To be provided as per condition C8
Sodium	µg/L	To be provided as per condition C8
Suspended Solids (Total)	µg/L	To be provided as per condition C8

Background groundwater monitoring program

- C8** A background groundwater monitoring program must be developed to include bore(s) that are located an appropriate distance from potential sources of impact from mining activities to provide the following:
- representative groundwater samples from the aquifers potentially affected by mining activities
 - at least twelve (12) sampling events (quarterly sampling) to determine background groundwater quality as far as practicable
 - background groundwater quality in hydraulically isolated background bore(s) that have not been affected by any mining activities
 - the final groundwater contaminant parameters and trigger levels required for each bore type must be provided according to condition **C10**.
- C9** The groundwater monitoring data must be reviewed on an annual basis. The review must include the assessment of groundwater levels and water quality data, and the suitability of the monitoring network. The assessment must be submitted to the administering authority within **twenty-eight (28)** days of receiving the report.
- C10** Groundwater contaminant trigger levels as per Schedule C – Table 2 (Groundwater contaminant trigger levels) must be finalised based on a background groundwater monitoring program defined in condition **C8** and be submitted to the administering authority by **commencement of mining operations**.
- C11** Upon finalisation of the background groundwater monitoring program in accordance with condition **C10**, the environmental authority holder may apply to the administering authority for the frequency of the groundwater monitoring frequency to be amended.
- C12** The following information must be recorded in relation to all groundwater water sampling:
- the date on which the sample was taken
 - the time at which the sample was taken
 - the monitoring point at which the sample was taken
 - the results of all monitoring.

Acid rock drainage and leachate management

- C13** Subject to the release limits defined in Department Interest: Water, all reasonable and practicable measures must be implemented to prevent hazardous leachate being directly or indirectly released or likely to be released as a result of the activity to any groundwater.

Proposed EA Conditions: Schedule D – Noise and Vibration

D1 Noise nuisance

Noise from activities must not cause an environmental nuisance at any sensitive receptor or commercial place.

- D2** All noise from activities must not exceed the levels specified in Schedule D - Table 1 (Noise limits) at any sensitive receptor or commercial place.

Schedule D – Table 1 (Noise Limits)

Noise level dB(A)	7am – 6pm	6pm – 10pm	10pm – 7am
-------------------	-----------	------------	------------

	<i>Noise measured at a 'Sensitive Receptor'</i>		
L _A 10, adj, 10 mins	B/g + 5	B/g + 5	B/g + 3
L _A 1, adj, 10 mins	B/g +10	B/g +10	42
	<i>Noise measured at a 'Commercial place'</i>		
L _A 10, adj, 10 mins	B/g + 10	B/g + 10	B/g + 5

D3 Noise is not considered to be a nuisance under condition D1 if monitoring shows that noise does not exceed the following levels in the time periods specified in Schedule D – Table 1 (Noise limits).

D4 Noise monitoring

When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within fourteen (14) days of completion of the monitoring to the administering authority. Monitoring must include:

- a) L_A 10, adj, 10 mins
- b) L_A 1, adj, 10 mins
- c) the level and frequency of occurrence of impulsive or tonal noise
- d) atmospheric conditions including wind speed and direction
- e) effects due to extraneous factors such as traffic noise and other industrial or mining activities
- f) location date and time of recording.

D5 If monitoring indicates exceedance of the relevant limits in Condition **D2**, and the exceedance is due to the mining activity, then the environmental authority holder must:

- a) address the complaint including the use of appropriate dispute resolution if required
- b) implement noise abatement measures as soon as practicable so that emissions of noise from the activity do not result in further environmental nuisance.

D6 The method of measurement and reporting of noise monitoring must comply with the current edition of the administering authority's Noise Measurement Manual.

D7 Vibration nuisance

Vibration from the licensed activities must not cause an environmental nuisance, at any sensitive or commercial place.

D8 When requested by the administered authority, vibration monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorized officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within **fourteen (14)** days to the administering authority following completion of monitoring.

D9 If the environmental authority holder can provide evidence through monitoring that the limits defined in Schedule D – Table 2 (Vibration limits), are not being exceeded then the holder is not in breach of condition **D7**.

Monitoring must include:

- a) peak particle velocity (mm/s)
- b) air blast overpressure level (dB linear peak)
- c) location of the blast/s within the mining area (including which bench level)
- d) atmospheric conditions including temperature, relative humidity and wind speed and direction, and
- e) location, date and time of recording.

Schedule D – Table 2 (Vibration limits)

Vibration Parameter	Vibration measured at a sensitive or commercial place	
	Monday to Sunday 9am - 7pm	Other times and public holidays
Peak particle velocity (mm/s)	Maximum 5 mm/s for 4 out of 5 consecutive blasts	No blasting to occur
Peak particle velocity (mm/s)	10 mm/s maximum	No blasting to occur

Note: The method of measurement and reporting of vibration levels must comply with the latest edition of the Environmental Protection Agency's vibration and air blast overpressure monitoring guideline.

D10 If monitoring indicates exceedance of the relevant limits in Schedule D – Table 2 (Vibration limits), then the environmental authority holder must:

- a) address the complaint including the use of appropriate dispute resolution if required, and/or
- b) immediately implement vibration abatement measures so that vibration from the activity does not result in further environmental nuisance.

D11 Airblast overpressure nuisance

The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Schedule D – Table 3 (Airblast overpressure level) at any nuisance sensitive or commercial place.

Schedule D – Table 3 (Airblast overpressure level)

Parameter	Airblast overpressure measured at a sensitive or commercial place	
	Monday to Sunday 9am - 7pm	Other times and public holidays
Air blast overpressure level (dB [Lin] Peak)	Maximum 115 dB for 4 out of 5 consecutive blasts	No blasting to occur
Air blast overpressure level (dB [Lin] Peak)	120 dB maximum	No blasting to occur

D12 When requested by the administering authority, airblast overpressure monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorized officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within **fourteen (14)** days to the administering authority following completion of monitoring.

D13 Airblast overpressure monitoring must include the following descriptors, characteristics and conditions:

- a) location of the blast(s) within the mining area
- b) atmospheric conditions including temperature, relative humidity and wind speed and direction, and
- c) location, date and time of recording.

D14 If monitoring indicates exceedance of the relevant limits in Schedule D – Table 3 (Airblast overpressure method), then the environmental authority holder must:

- a) Address the complaint including the use of appropriate dispute resolution if required, and
- b) Implement airblast overpressure abatement measures as soon as practicable so that airblast overpressure from the activity does not result in further environmental nuisance.

D15 The method of measurement and reporting of airblast overpressure levels must comply with the current

edition of the administering authority's Noise Measurement Manual.

Proposed EA Conditions: Schedule E – Waste

- E1** Waste from the Coal Handling and Preparation Plant shall be disposed of in:
- regulated dams in accordance with conditions **G1 to G18** (Dams) of this Environmental Authority if the residual shear strength of the waste is less than 1000 Pascals when deposited, or
 - the Authorised Spoil Disposal Areas in accordance with conditions **E2 to E7** if the residual shear strength of the waste is equal or more than 1000 Pascals when deposited.

Spoil disposal facility - certification and operation

- E2** Authorised spoil disposal facilities, used for the disposal of waste are located within the control points defined in Schedule E – Table 1 (Location of spoil disposal facility).

Schedule E – Table 1 (Location of spoil disposal facility)

Name of Spoil Disposal Facility	Latitude (GDA 94)	Longitude (GDA 94)
Dry Reject Emplacement Area	A list to be provided as per condition E5	A list to be provided as per condition E5

- E3** Spoil Disposal Facilities shall be designed to prevent environmental harm arising from contaminants being generated in the facility, leachate and runoff from the facility or other sources.
- E4** Authorised spoil disposal facility(s) must be constructed and maintained in accordance with certified plans, submitted to the administering authority.
- E5** Design plans for the authorized spoil disposal facility(s) must include performance indicators, such that:
- during operations the spoil disposal facility(s) will be operated with minimal or no potential for adverse environmental harm resulting from collapse of any component of facility
 - the potential for leachate generation will be minimal or nonexistent
 - and adequate drainage structures, erosion protection and storage are provided to manage seasonal and rare rainfall events with minimal or no environmental harm.
- E6** Construction of any spoil disposal facility detailed in Schedule E – Table 1 (Location of spoil disposal facilities) must not commence unless:
- the environmental authority has submitted to the administering authority two copies of a design plan, and
 - certification from a suitably qualified and experienced person that the design of the spoil disposal facility(s) will deliver the performance stated in that design plan and that it will be compliant in all other respects with this environmental authority, and
 - at least 20 business days has passed since the receipt of those documents by the administering authority, or
 - the administering authority notifies the environmental authority holder that a design plan and certification, has been submitted for that disposal facility.

Operational plan – Spoil disposal facility

- E7** An operational plan must be developed and maintained for the spoil disposal facility. The operational plan must include but not be limited to:
- e) description of landform development stages of the spoil disposal facility
 - f) placement technique for spoil and waste material from the coal handling and processing plant on
 - g) the mine site
 - h) management of any containment structures within the spoil disposal facility designed to contain materials from the coal handling and processing plant on the mine site
 - i) Demonstration of how operations of the spoil disposal facility are consistent with the accepted design plan for the facility
 - j) Decommissioning and rehabilitation strategies for the spoil disposal facility that demonstrate consistency with conditions of this environmental authority.

Tailings/coal rejects

- E18** The management of tailings disposal must be in accordance with the following:
- a) all tailings material must be progressively characterised during disposal for acid generating capacity and selected metals and salts. Samples shall be tested for: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S), Chromium Reducible Sulphur (Scr), Boron (B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄)
 - b) one tailing sample will be collected each and every week while the mine coal processing plant is operational and the sample will be stored. After 4 samples have been collected the samples will be composited and the composite sample characterised as outlined in (a) above. A minimum of **one (1)** composite tailing sample will undergo characterisation per month. A minimum of **twelve (12)** composite tailing samples will undergo characterisation per year
 - c) records must be kept of the tailings disposal to indicate locations and characteristics of tailings stored within the tailings storage facility
 - d) where the acid producing potential of tailings material has not been conclusively determined, geochemical kinetic testing must be conducted to indicate oxidation rates, potential reaction products and effectiveness of control strategies
 - e) tailings identified as potentially acid producing will be covered or placed to minimise surface oxidation. The maximum duration of surface exposure of these materials is **one (1) month**.

Mine waste

- E19** A Mining Waste Management Plan together with the certification by an appropriately qualified person must be developed and implemented during the continuation of the environmental authority. The Mining Waste Management Plan must at a minimum include:
- a) characterisation programs to ensure that all mining waste is progressively characterised during disposal for net acid producing potential, salinity and the following contaminants: pH, Electrical Conductivity (EC), Acid Neutralising Capacity (ANC), Net Acid Generation (NAG) (reporting NAG capacity and NAG pH after oxidation), Total Sulphur (S), Chromium Reducible Sulphur (Scr), Boron

(B) Cadmium (Cd), Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na), Zinc (Zn) and Sulphate (SO₄)

- b) characterisation programs to ensure that the physical properties of the mining waste is progressively characterised during disposal
- c) the availability or leachability of metals from the mining waste
- d) quantification of PAF from mining waste present
- e) review impacts of the PAF mining waste on the rehabilitation
- f) management actions for mining waste that has been identified as having a high availability or leachability of metals
- g) management actions for mining waste that has been defined as PAF
- h) identification of environmental impacts and potential environmental impacts
- i) control measures for routine operations to minimise likelihood of environmental harm
- j) contingency plans and emergency procedures for non-routine situations
- k) periodic review of environmental performance and continual improvement.

Proposed EA Conditions: Schedule F – Land

F1 Preventing contaminant release to land

Contaminant must not be released to land in a manner which constitutes nuisance, material or serious environmental harm.

F2 Topsoil

Topsoil must be strategically stripped ahead of mining in accordance with a topsoil management plan.

F3 A topsoil inventory which identifies the topsoil requirements for the Eagle Downs Coal Mine project and availability of suitable topsoil on site must be detailed in the Plan of Operations.

F4 Rehabilitation landform criteria

Complete an investigation into rehabilitation of disturbed areas and submit a report to the administering authority proposing acceptance criteria by **30 June 2014** for administering authority review and comment. On acceptance of the criteria proposed in the rehabilitation management plan, the criteria must be specified in the Environmental Authority.

The rehabilitation management plan must, at a minimum:

- a) map existing areas of rehabilitation
- b) develop design objectives for rehabilitation of disturbed areas and post-mining land uses across the mine
- c) specify spoil characteristics, soil analysis, soil separation for use on rehabilitation
- d) detail rehabilitation methods applied to areas
- e) contain landform design criteria including end of mine design
- f) detail how landform design will be consistent with the surrounding topography
- g) identify success criteria for areas and itemise revegetation criteria
- h) explain planned native vegetation rehabilitation areas and corridors
- i) identify at least a minimum of three (3) reference and three (3) rehabilitation sites to be used to develop rehabilitation success criteria
- j) describe rehabilitation indicators and the monitoring program to be used
- k) develop a contingency plan for rehabilitation maintenance or redesign

- l) describe end of mine landform design plan and post-mining land uses across the mine
- m) include a cost benefit analysis/triple bottom line assessment (or an alternative assessment method) of the proposed final landform design criteria and alternatives.

F5 All areas significantly disturbed by mining activities must be rehabilitated to a stable landform with a self-sustaining vegetation cover in accordance with Schedule F – Table 1 (Final land use and rehabilitation approval schedule) and Schedule F – Table 2 (Landform design criteria).

Schedule F – Table 1 (Final land use and rehabilitation approval schedule)

	Disturbance type					
	DREA	Subsided Areas	Catch Dams & Main Dam	Infrastructure	ROM area	Road(s) and tracks
Projective surface area (ha)*						
Pre-mine land use						
Post-mine land use						
Post-mine land capability classification						
Projective cover range (%)						

* Note details to be provided by proponent as per condition F4.

Schedule F – Table 2 (Landform design criteria)

Disturbance Type	Maximum Slope Range %	Projective Surface Area (ha)
DREA		
Subsided Areas		

* Note details to be provided by proponent as per condition F4.

F6 Progressive rehabilitation must commence when areas become available within the operational land.

F7 Development of acceptance criteria in accordance with condition F4 is to consider the re-establishment of representative regional ecosystems (reference sites or another suitable alternative approved by the administering authority) and functioning habitat of areas equal to or greater than areas to be cleared and specific revegetation performance descriptors (e.g. rehabilitated areas are to display characteristics of the existing (pre-mining) regional ecosystems).

F8 Areas which are to be rehabilitated to native ecosystem must achieve a self sustaining native ecosystem with species composition and distribution similar to an analogue/reference site or another suitable alternative approved by the administering authority.

F9 Where reasonable and practicable, areas of the site where grazing is nominated as the post-mine land use must include native grass species endemic to the area.

F10 Complete an assessment report, to be undertaken by a Registered Professional Engineer of

Queensland (RPEQ) of geotechnical issues and erosivity of the proposed final landforms, including the subsided areas and the Dry Reject Emplacement Area, by commencement of mining operations to demonstrate long-term landform stability. Reference is to be made to the Queensland Mining Guidelines (or subsequent reprints) in making this assessment.

- F11** The Environmental Management Plan and Plan of Operations must be consistent with the geotechnical and erosivity assessment (identified in condition F10) within three (3) months of the completion of the assessment.

Rehabilitation monitoring program

- F12** Once rehabilitation has commenced, the holder of the environmental authority must conduct a Rehabilitation Monitoring Program on a yearly basis, which must include sufficient spatial and temporal replication to enable statistically valid conclusions as established under the rehabilitation program.
- F13** The Rehabilitation Monitoring Program must be developed and implemented by a person possessing appropriate qualifications and experience in the field of rehabilitation management, nominated by the environmental authority holder.
- F14** The Rehabilitation Monitoring Program must be included in the Plan of Operations and updated with each subsequent Plan of Operations, describing:
- a) how the rehabilitation objectives as per condition **F5** will be achieved
 - b) verification of rehabilitation success.

Post closure management plan

- F15** A Post Closure Management Plan for the site must be prepared at least **18 months prior** to the final coal processing on site and implemented for a nominal period of:
- a) at least **thirty (30) years** following final coal processing on site, or
 - b) a shorter period if the site is proven to be geotechnically and geochemically stable and it can be demonstrated to the satisfaction of the administering authority that no release of contaminants from the site will result in environmental harm.
- F16** The Post Closure Management Plan must include the following elements:
- a) operation and maintenance of:
 - I. wastewater collection and reticulation systems
 - II. wastewater treatment systems
 - III. the groundwater monitoring network
 - IV. final cover systems
 - V. vegetative cover.
 - b) monitoring of:
 - I. surface water quality
 - II. groundwater quality
 - III. seepage rates
 - IV. erosion rates
 - V. the integrity and effectiveness of final cover systems
 - VI. the health and resilience of native vegetation cover.

F17 Storage and handling of chemicals

All chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of the relevant Australian Standard.

F18 Spillage of all chemicals must be controlled in a manner that prevents environmental harm.

F19 Infrastructure

All infrastructure, constructed by or for the environmental authority holder during the licensed activities including water storage structures, must be removed from the site prior to surrender, except where agreed in writing by the post-mining land owner/holder.

NOTE: This is not applicable where the landowner/holder is also the environmental authority holder.

Proposed EA Conditions: Schedule G – Dams

All Dams

G1 The hazard category of each dam must be determined by a suitably qualified and experienced person, prior to its construction and at least once each year thereafter.

G2 The holder of this environmental authority must not commence construction of any dam determined to be in the significant or high hazard category ie. a regulated dam, unless the location, basic details, and hydraulic performance of that dam are specifically referenced Schedule G – Table 1 (Location of Regulated Dams), Schedule G – Table 2 (Basic Details of Regulated Dams) and Schedule G – Table 3 (Hydraulic Performance of Regulated Dams of this Environmental Authority).

G3 The holder of this environmental authority must not abandon any dam but must decommission each dam so as to avoid any environmental harm.

G4 As a minimum, decommissioning must be conducted such that each dam:

a) either:

- (i) becomes a stable landform, that no longer contains flowable substances, or
- (ii) is approved or authorised under relevant legislation for a beneficial use, or
- (iii) is a void authorised by the administering authority to remain after decommissioning, and

b) is compliant with the rehabilitation requirements of this Environmental Authority.

Regulated Dams - Location

G5 The following regulated dams must be located within the control points defined in Schedule G – Table 1, below.

Schedule G – Table 1 (Location of regulated dams)

Name of Regulated Dam	Latitude (GDA 94)	Longitude (GDA 94)
	(Yet to be referenced in accordance with condition G2)	

Note: Details necessary to complete all tables to be provided by the proponent prior to issue of this Environmental Authority.

G6 The following regulated dams must conform to the basic details in Schedule G – Table 2, below.

Schedule G – Table 2 (Basic details of regulated dams)

Name of Regulated dam	Hazard Category	Maximum surface area of dam (ha)	Maximum volume of dam (m3)	Maximum depth of dam (m)	Use of dam
	(Yet to be referenced in accordance with condition G2)				

G7 The following regulated dams must meet the hydraulic performance criteria specified in Table 3, below.

Schedule G – Table 3 (Hydraulic performance of regulated dams)

Name of Regulated dam	Spillway Capacity or Diversion Capacity (Levees) AEP	Design Storage Allowance (Dams other than levees) AEP	Mandatory Reporting Level (Dams other than levees) AEP
	(Yet to be referenced in accordance with condition G2)		

Regulated Dams - Certification and Operation

- G8** The holder of this environmental authority must not commence construction of a regulated dam unless:
- (a) the holder has submitted to the administering authority two copies of a design plan, together with the certification of a suitably qualified and experienced person that the design of the regulated dam will deliver the performance stated in the design plan and that it will be compliant in all other respects with this environmental authority
 - (b) at least 20 business days has passed since the receipt of those documents, or the administering authority notifies the holder that a design plan and certification, has been received.
- G9** When construction of any regulated dam is complete, the holder of this environmental authority must submit to the administering authority two copies of a set of ‘as constructed’ drawings, together with the certification of a suitably qualified and experienced person that the dam ‘as constructed’ will deliver the performance stated in the design plan and it is compliant in all respects with this environmental authority.
- G10** An operational plan must be kept current for each regulated dam.
- G11** Where an operational plan covers decommissioning and rehabilitation, those operations are to be consistent with the design plan for the dam and the rehabilitation requirements of this environmental authority.
- G12** The holder of this environmental authority must notify the administering authority immediately the level in any regulated dam reaches the mandatory reporting level (MRL), and immediately act to prevent or

minimize any actual or potential environmental harm.

Regulated Dams - Annual Inspection and Report

- G13** Each regulated dam must be inspected annually by a suitably qualified and experienced person.
- G14** At each annual inspection, the condition and adequacy of each regulated dam must be assessed for dam safety and against the necessary structural, geotechnical and hydraulic performance criteria.
- G15** At each annual inspection, if a mandatory reporting level is required, it must be determined and marked on each regulated dam.

- G16** A final assessment of adequacy of available storage in each regulated dam must be based on a dam level observed within the month of October and result in an estimate of the level in that dam as at 1 November of that same year.
- G17** For each annual inspection, two copies of a report on the condition and adequacy of each regulated dam, certified by the suitably qualified and experienced person and including any recommended actions to be taken to ensure the integrity of each regulated dam; must be provided to the administering authority by 1 December.
- G18** The holder of this environmental authority must, upon receipt of the annual inspection report, consider the report and its recommendations, and take action to ensure that each regulated dam safely performs its intended functions.

Proposed EA Conditions: Schedule H – Nature Conservation

H1 Environmental offsets

The environmental authority holder must develop and submit to the administering authority within **twelve (12)** months of issue of this environmental authority an offsets package in accordance with the Queensland Government Environmental Offsets Policy 2008 (QGEOP) specific issue policy for vegetation management titled Policy for Vegetation Management Offsets, September 2007, Department of Natural Resources and Water (or any other relevant specific issue offsets policy prepared under the QGEOP framework) to offset the loss of remnant vegetation.

H2 As a minimum requirement the offsets package must include the following:

- a) a proposed ecologically equivalent vegetation community to be managed and/or rehabilitated in perpetuity
- b) an agreement and commitment of parties to implement the offset package
- c) a management plan including a map of the boundary of the proposed offset, environmental objectives, performance criteria, monitoring, reporting, corrective action, and responsibility and timing for permanent protection and management including control of weeds, cattle, site access, erosion and sedimentation and fire management.

H3 A Weed Management Plan must be developed and implemented during the continuation of this environmental authority, and prior to the commencement of construction activities. The Weed Management Plan must describe how the weeds are to be managed in accordance with the *Land Protection (Pest and Stock Route Management) Act 2002* and/or local government requirements for weeds not declared under state legislation.

Proposed EA Conditions: Schedule I – Community

I1 In consultation with the administering authority, cooperate with and participate in any community environmental liaison committee established in respect of either the licensed place specifically or the area where the licensed place is located.

Proposed EA Conditions: Schedule C – Water

W42 Sewage effluent

All effluent released from the sewage treatment facilities must be monitored at the frequency and for the parameters specified in Schedule C – Table 13 (Sewage effluent quality targets).

Schedule C – Table 13 (Sewage effluent quality targets)

Monitoring point	Release Limit				Frequency
	Quality characteristics	Minimum	50th Percentile	Maximum	
Treated effluent storage pond	5-day Biological Oxygen Demand (mg/L)	-	-	20	monthly
	Suspended Solids (mg/L)	-	-	30	
	Thermotolerant Coliforms (Cfu/100mL2)	-	100	1000	
	Total Phosphorus (mg/L)	-	5	15	
	Total Nitrogen (mg/L)	-	10	30	
	pH	6.5	-	8.5	

- W43** Sewage effluent used directly from the sewage treatment facilities for dust suppression or irrigation must not exceed sewage effluent release limits defined in Schedule C – Table 13 (Sewage effluent quality targets).
- W44** Sewage effluent used for dust suppression or irrigation must not cause spray drift or over spray to any sensitive or commercial place.
- W45** Sewage effluent from sewage treatment facilities not used for dust suppression or irrigation must be reused or evaporated.
- W46** Subject to conditions W42 to W45 inclusive, sewage effluent from sewage treatment facilities must be reused or evaporated and must not be directly released from the sewage treatment plant to any waters or the bed and banks of any waters.
- W47** The effluent irrigation areas must have a separation distance of at least thirty (30) metres from any groundwater bores and surface waters.
- W48** The irrigation of treated effluent must be carried out in a manner such that:
- vegetation is not damaged
 - soil erosion and soil structure damage is avoided
 - there is no surface ponding of effluent
 - percolation of effluent beyond the plant root zone is minimised
 - the capacity of the land to assimilate nitrogen, phosphorus, salts, organic matter as measured by oxygen demand and water is not exceeded
 - the quality of groundwater is not adversely affected.
- W49** Notices must be prominently displayed on any treated effluent irrigation area warning staff and the public that the area is irrigated with treated effluent and not to use or drink the treated effluent. These notices must be maintained in a visible and legible condition.

W50 The daily volume of contaminants released to land must be determined by an appropriate method, for example, a flow meter and records kept of such determinations.

Water sediment controls

- W51** All reasonable and practicable erosion protection measures and sediment control measures must be implemented and maintained to minimise erosion and the movement of sediment, including:
- a) all clean waters, from undisturbed areas, kept separate from dirty waters from disturbed areas
 - b) water from disturbed catchments diverted into the mine water management system and sedimentation dams
 - c) new sedimentation dams designed to capture the sediment volume calculated for the catchment area for a 24 hour 10 year annual recurrence interval (ARI) storm event
 - d) sediment shall be excavated from sediment dams as required to maintain design capacity.