

# **Environmental Impact Statement (EIS) Assessment Report under the *Environmental Protection Act 1994***

Ellensfield Coal Mine Project

Proposed by Ellensfield Coal Management Pty Ltd

December 2012



Prepared by: Statewide Environmental Assessments, Department of Environment and Heritage Protection

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# 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 Ellensfield Coal Mine Project (the project) proposed by Ellensfield Coal Management Pty Ltd (the proponent).

On 7 August 2007, the proponent applied for approval to prepare a voluntary EIS for the project. On 13 August 2007, the Department of Environment and Heritage Protection (then the Environmental Protection Agency) approved the application.

On 14 September 2007 the project was declared a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including that it be assessed through the EP Act EIS process under the agreement between the Commonwealth of Australia and the State of Queensland (the bilateral agreement) relating to environmental impact assessment. The controlling provisions are sections 18 and 18A (Listed threatened species and communities). This report contains an assessment of the significance of impacts of the action on the controlling provisions. A copy of this report will be given to the Commonwealth Environment Minister, who will decide whether to approve or refuse the controlled action under Part 9 of the EPBC Act.

The department, as the administering authority, has coordinated the EIS process for project under the EP Act. This assessment report has been prepared pursuant to sections 58 and 59 of the EP Act. Section 58 of the EP Act lists the criteria that the department must consider when preparing an EIS assessment report and section 59 states that the content of the report must:

- a. address the adequacy of the EIS in addressing the final terms of reference (TOR)
- b. address the adequacy of the environmental management plan (EM plan)
- c. make recommendations about the suitability of the project
- d. recommend any conditions on which any approval required for the project may be given
- e. contain another matter prescribed under a regulation.

The purpose of this report is to:

- a. provide an assessment of the project EIS documentation to complete the EIS process under section 60 of the EP Act
- b. provide information for assessment of the project under the bilateral agreement for the purposes of the EPBC Act.

This report summarises the key issues associated with the potentially adverse and beneficial environmental, economic and social impacts of the project. It discusses the management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project. It notes those issues of particular concern that were either unresolved or require specific conditions in order for the project to proceed.

The giving of this report to the proponent will complete the EIS process under the EP Act.

## 2 Project details

The proponent for the project is Ellensfield Coal Management Pty Ltd (ECM) which is a wholly owned subsidiary of Rio Doce Australia Pty Ltd.

The project is located in the Bowen Basin (within the Isaac Regional Council area), approximately 35 kilometres (km) north-east of Moranbah and approximately 175 km south-west of Mackay. It lies on the northern side of the Peak Downs Highway, approximately midway between Coppabella and Moranbah. The project is also located within the headwaters of the Teviot Brook Catchment approximately 16 km upstream of the Isaac River. The project is located wholly within mining lease application (MLA) 70393.

The project would involve development of a greenfield underground coal mine producing up to three million tonnes per year (Mt/y) of semi-soft coking and thermal coal for export. The project would use both the 'longwall' mining method and 'bord and pillar' mining to extract coal from the Leichhardt Coal Seam of the Rangal Coal Measures.

The proponent expects to commence construction and mine development activities between late 2013 and early 2015, with longwall production and coal processing planned to commence in 2017, and would continue for a period of approximately 20 years.

The project, which was updated through two changed mine plans during the EIS process, would include:

- access via two surface drifts (via box cuts); the man and materials drift and the conveyor drift and a ventilation shaft, of which an estimated 210,000 cubic metres (m<sup>3</sup>) of that excavated material would be used as fill material in the construction process
- the drift entrances which would be backfilled, consequently there will be no final void at the end of the project
- production of on average 2.5 Mt/y run-of-mine (ROM) coal to produce approximately 2.1 Mt/y of product coal, utilising a longwall mining and bord and pillar mining system
- 22 longwall panels<sup>1</sup> to extract ROM coal within the Leichhardt Seam. The planned longwall panels have been orientated to avoid faulted areas
- a 65,000 tonne (t) capacity ROM stockpile would be located on the surface, close to the conveyor drift entrance coal portal which would form the interface between the underground mine and the truck load-out (TLO) facility.
- ROM coal being stockpiled and loaded at the project TLO facility and transported by an upgraded road link through the adjacent Broadlea Coal Mine (BLCM) from the project TLO facility to the Carborough Downs Coal Mine (CDCM) coal handling and preparation plant (CHPP) for processing. Coal processing would be carried out under formal toll washing arrangements between the proponent and CDCM and would be subject to the environmental authority (EA) for the CDCM
- ROM coal being transported by 300 t capacity road trains. Approximately 10,000 truckloads per year of ROM coal (on average 30 truck movements/day) would be transported from the project to the CDCM
- ROM coal being stockpiled at a new ROM stockpile facility at CDCM
- all of the approximately 8.1 Mt of mine waste (rejects and tailings) generated from the washing of coal over the life of the mine, being stored at the CDCM waste storage facility
- product coal being stockpiled at the CDCM product coal handling facility and dispatched using the existing CDCM rail load-out facility for transport to either Dalrymple Bay Coal Terminal (DBCT) or Abbot Point Coal Terminal (APCT), via the recently completed Goonyella to Abbot Point (GAP) rail line, for export to international markets
- approximately five trains per week transporting coal from the project rail load-out facility at the CDCM to port for export

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<sup>1</sup> There would be twenty-five (25) longwall blocks as some longwall panels have two (2) blocks e.g. LW101 has LW101a and LW1010b

- a mine infrastructure area (MIA) which would include administration and operations buildings, fuel storage areas, water storage, equipment maintenance areas, laboratories, hardstand areas, power plant, workshops and associated facilities and services
- a power plant, consisting of approximately 15 power generation modules, each having an electricity generation capacity of between one and three megawatt (MW). The peak electrical demand for the site (up until the time the Queensland electricity network is extended to the site) is estimated up to 20 MW
- development of a dedicated 66 kilovolt (kV) transmission line to be constructed from the CDCM main substation to the project main mine substation
- realignment of the existing 132 kV transmission line that crosses the project subsidence area prior to commencement of mining
- a fibre optic cable running from the project to the Telstra network adjacent to the CDCM
- development of a gas drainage well and mine water management reticulation network
- construction of a diversion bund to re-direct surface runoff away from the MIA to ensure clean and contaminated water separation is maintained
- installation of a reverse osmosis (RO) desalination plant and brine storage to treat a maximum of 1.5 megalitres (ML) of water per day to meet the raw water demand for the site, including for dust suppression and potable water supply. Should the supply of permeate from the RO plant be unable to meet raw water demand an external water supply (sourced from the CDCM) would be used to augment supply
- at the end of mine life, brine waste being disposed of to an appropriately licensed off-site facility
- construction of a supplementary incoming raw water pipeline, site water storage facilities (dams) and associated distribution network
- installation of both clean and wastewater reticulation networks
- a mine water collection and containment system to manage mine water from various sources
- a mine water dam (MWD) in the form of a large 'turkey's nest' type engineered embankment structure. It would be for mine and gas drainage associated water that would be subjected to treatment by RO
- a sewage treatment plant (STP) that would use a nutrient reduction process with membrane technology, to achieve Class A water quality for discharge
- accommodation facilities to provide for about 90 per cent (approximately 350 personnel) of the proponents employed by QRI Coppabella and MAC Coppabella camp accommodation for construction and operational personnel. Other workers would be likely be accommodated in Moranbah in proponent owned and managed accommodation.

The MLA covers an area of approximately 3388 ha. Direct surface disturbance impacts associated with the MIA would be approximately 271 hectares (ha), including:

- MIA—116 ha (includes a 50 metre (m) buffer)
- MWD—54 ha (includes a 50 m buffer)
- transfer dam—2.05 ha (within the MIA surface area)
- temporary ROM dam—0.47 ha (within the MIA surface area)
- permanent ROM dam—1.14 ha (within the MIA surface area)
- haul Road—101 ha (based on a 40 m width up to the southernmost point of the infrastructure area, after this, the haul road surface area is incorporated into the MIA buffer).

The surface area of the entire underground mining operation (including the longwalls, roadways, drives and bord and pillar areas) would be just over 1000 ha. The total surface area of the longwall panels would be some 600 ha. The total area within the MLA which would experience significant (i.e. greater than 50 millimetres (mm)) is estimated at 931 ha, which is approximately 27.5 per cent of the MLA.

Coal tailings and rejects from the processing of ROM coal in the CDCM CHPP would be subject to separate assessment and approval under the EA for the CDCM. This EIS process did not assess the potential environmental impact or suitability of the proposal to process the project's ROM coal at the CDCM and to store waste at that site.

Both the proponent and CDCM have undertaken separate studies to review the potential impact of CHPP feed rates and stockpile sizes for both ROM and product coal, as well as train load-out rates, on the CDCM site. These studies concluded that an upgrade of the CDCM CHPP1 and CHPP2 to 700 t/h, combined with the construction of a new ROM stockpile and associated conveyors, would be effective in managing such production.

The EIS estimated the extent to which the combined processing of project ROM coal and CDCM ROM coal would increase the volume of reject waste material produced. It is planned to manage the rejects generated by using the existing CDCM reject emplacement facility until that facility reaches full capacity, likely in 2017. In order to accommodate the remaining rejects for the CDCM and the project it is planned to establish an additional rejects emplacement facility on the CDCM lease ML70340. Areas totalling 155 ha in area have been identified as potentially suitable sites for a new emplacement facility on the CDCM.

The proposed use of the existing CDCM waste emplacement facility, together with the additional emplacement facility would be subject to separate assessment and decision-making under the EP Act through the EA for the CDCM.



## 3 The EIS process

### 3.1 Timeline

On 7 August 2007, Ellensfield Coal Management Pty Ltd applied to the department for approval to voluntarily prepare an EIS under section 70 of the EP Act. The application included an initial advice statement, draft terms of reference (TOR) and a list of interested and affected persons. This application was approved by the department on 13 August 2007.

The project was determined as being a controlled action under section 75 of the EPBC Act on 14 September 2007, including that the assessment would be by way of an EP Act EIS process accredited under the bilateral agreement.

A notice of publication of the draft TOR was issued to the proponent on 28 September 2007. A public notice of the comment period for the draft TOR was advertised in *The Courier-Mail* and *Mackay Daily Mercury* on 29 September 2007 and placed on the department's website on 1 October 2007. The comment period on the draft TOR was 30 business days, commencing on 1 October 2007 and closing on 9 November 2007. The proponent issued copies of the TOR notice to affected and interested persons.

Comments on the draft TOR were received from 13 interested parties within the comment period. The comments were accepted by the delegate and, together with those of the department, were forwarded to the proponent on 12 November 2007. The proponent responded to the comments on 18 December 2007. The department considered the response and all the comments received and issued the final TOR for the project on 4 February 2008 in accordance with section 46 of the EP Act.

The department received one late comment from the former Belyando Shire Council on the draft TOR after the TOR were finalised. The department forwarded the comment to the proponent with a request that it consider the comment whilst preparing the EIS.

The EIS was submitted to the department on 9 April 2009. The department commenced a review of the EIS in accordance with section 49 of the EP Act and on 11 May 2009, advised the proponent that there were deficiencies in the submitted EIS. On 12 May 2009, the proponent sought additional time to address these deficiencies and on 12 May 2009, the department agreed to the proponent's request to extend the decision date to 24 June 2009.

On 21 May 2009, comments were provided by the department to the proponent, setting out information about the deficiencies in the EIS. On 2 June 2009, a revised EIS was submitted. On 29 June 2009, the department decided under section 49(5) of the EP Act that the EIS had addressed the TOR in an acceptable form and that the EIS could proceed to public notification. A notice of that decision was then issued to the proponent. An EIS notice announcing the start of the submission period for the EIS was published on the department's website on 3 July 2009 and advertised in *The Courier-Mail* and the *Mackay Daily Mercury* on 4 July 2009 and the *Miners MidWeek* on 8 July 2009. The EIS submission period was 31 business days from 6 July 2009 to 17 August 2009. The proponent was required to issue copies of the EIS notice to all affected and interested persons.

Eleven submissions were received on the EIS within the submission period. They were from Commonwealth, state and local government agencies, a non-government organisation and a member of the public. Six submissions were received after the close of the submission period. These submissions were from state government agencies and a non-government organisation. All 17 submissions were accepted in accordance with section 55 of the EP Act. These submissions and a submission from the department were forwarded to the proponent on 31 August 2009 for its consideration and response back to the department. In keeping with the EP Act, the proponent was given 20 business days, until 28 September 2009, within which to respond to the comments and provide a supplementary report to the department.

Between September 2009 and September 2012, the proponent requested 16 successive extensions of time in order to respond to submissions. This included six detailed written requests from the department to clarify the nature of additional information required. The department agreed to each request by the proponent for additional time to respond to submissions.

The proponent provided the department with a supplementary report to the EIS on 6 December 2010. Copies of the response to submissions were then distributed to all submitters. On 20 January 2011, at the request of the proponent, the department extended the deadline its decision on whether the EIS may proceed (under section 56A of the EP Act) by 29 business days (to 3 March 2011) due to disruption caused by the Queensland flood crisis in 2011. Both department's own review and comments received from submitters identified further significant shortcomings in the EIS supplementary report. On 4 February 2011, the department met with the proponent to discuss those outstanding matters and agreed to provide advanced copies of the public submissions received, in order to allow the proponent to prepare its formal response. On 3 March 2011 the department provided all submissions received on the EIS supplementary report and agreed the proponent's request to extend the final date for deciding the adequacy of the EIS until 14 April 2011.

As noted above, the proponent amended the mine plan twice during the EIS process. This required reassessment of the previously submitted EIS documents in the light of the proposed changes. The proponent requested the period to submit a response to the submissions on the EIS be extended on 12 occasions between March 2011 and September 2012. The department agreed to all of these requests.

The final amendment to the EIS was made on 11 September 2012, and on 9 October 2012, under section 56A of the EP Act, the department decided that the submitted EIS could proceed to the assessment report phase. A notice of that decision, given to the proponent on 23 October 2012, included an attachment setting out the additional matters that would need to be addressed after the EIS assessment process concluded.

In the preparation of this report consideration has been given to submissions and comments received from members of the advisory body (see section 3.3.2 for advisory body constituents) and other interested parties throughout the EIS process. This EIS assessment report will be made available to the public on the department's website at [www.ehp.qld.gov.au](http://www.ehp.qld.gov.au).

## 3.2 Approvals under the EP Act

The project will require a mining lease for the land covered by mining lease application 70393.

The project will also require an environmental authority (EA) under the EP Act. The EA would need to cover the following activities that are directly associated with, or facilitate or support, the mining activities and which would (were they not conducted on a mining tenement) otherwise require approval under the EP Act as environmentally relevant activities (ERAs):

- ERA 8 Chemical storage
- ERA 14 Electricity generation
- ERA 15 Fuel burning
- ERA 18 Boiler making or engineering
- ERA 21 Motor vehicle workshop operation
- ERA 23 Metal treatment or coating
- ERA 29 Petroleum product or oil storage
- ERA 38 Surface coating
- ERA 43 Concrete batching
- ERA 50 Bulk material handling (Note: ERA 50 will not be covered in the EA but in a Development Approval (DA) administered by the department)
- ERA 63 Sewage treatment
- ERA 64 Water treatment
- ERA Petroleum product or oil storage.

The EA application will need to list all the relevant ERAs, including relevant thresholds under schedule 2 of the Environmental Protection Regulation 2008 that would apply to the project.

As noted previously in this report, the proposed use of the existing CDCM CHPP and waste emplacement facility together with the additional emplacement facility will be subject to separate assessment and decisions likely under the CDCM EA and EM plan.

## 3.3 Consultation program

### 3.3.1 Public consultation

In addition to the statutory requirements for advertising the TOR and EIS notices and the mailing of notices to interested and affected parties, the proponent also undertook a community engagement process during the public submission period of the draft EIS. This included interested and affected parties including:

- government agencies
- state corporations
- interest groups
- service providers
- members of the community
- other people.

The proponent also circulated information about the project to the interested and affected groups through newsletters and meetings discussing the proposal and inviting feedback and enquires.

### 3.3.2 Advisory body

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

- Construction, Forestry, Mining and Energy Union
- Department of Communities
- Department of Community Safety
- Department of Education and Training
- Department of Employment, Economic Development and Innovation
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (formerly Department of Environment, Water, Heritage and the Arts)
- Department of Infrastructure and Planning
- Department of Transport and Main Roads
- Ergon Energy
- Fitzroy Basin Association Inc.
- Isaac Regional Council
- Mackay Conservation Group
- Mackay Regional Council
- North Queensland Land Council Aboriginal Corporation
- Powerlink Queensland
- Queensland Health
- Queensland Police Service
- Queensland South Native Title Services Ltd
- Queensland Treasury
- Whitsunday Regional Council.

On 26 March 2009 and 24 May 2012, the names of several of those departments changed (see Public Service Departmental Arrangements Notice (No.2) 2009 and Public Service Departmental Arrangements Notice (No.3) 2012). Consistent attendance by relevant advisory bodies was maintained through the changes. Table 1 summarises the changes that occurred to Queensland Government departments referred to in this report.

**Table 1 Changes to Queensland Government departments**

Previous department(s)	New department(s) (as of 26 March 2009)	New department(s) (as of 3 April 2012)
Department of Primary Industries and Fisheries Department of Mines and Energy Department of Tourism, Regional Development and Industry Department of Employment and Industrial Relations Queensland Treasury	Department of Employment, Economic Development and Innovation (DEEDI)	Department of State Development, Infrastructure and Planning Queensland Treasury and Trade Department of Agriculture, Fisheries and Forestry
Environmental Protection Agency Department of Natural Resources and Water	Department of Environment and Resource Management (DERM)	Department of Environment and Heritage Protection Department of Natural Resources and Mines Department of Energy and Water Supply Department of Science, Information Technology, Innovation and the Arts Department of National Parks, Recreation, Sport and Racing
Department of Local Government, Sport and Recreation	Department of Local Government and Planning (DIP) <sup>2</sup>	Department of Local Government
Department of Main Roads Queensland Transport	Department of Transport and Main Roads (DTMR)	Department of Transport and Main Roads
Department of Communities Department of Housing Disability Services Queensland Department of Child Safety Department of Education, Training and the Arts Queensland Police Service Queensland Health	Department of Communities (DoC) Department of Community Safety (DCS) Department of Education and Training (DET) Queensland Police Service (QPS) Queensland Health (QH)	Department of Education, Training and Employment Department of Communities, Child Safety and Disability Services Department of Community Safety Department of Housing and Public Works Department of Aboriginal and Torres Strait Islander and Multicultural Affairs Queensland Police Service Queensland Health
Department of Emergency Services	Department of Community Safety (DCS)	Department of Community Safety

An advisory body briefing for the project was held in Brisbane on 5 August 2009. A field trip to inspect the project site took place on 28 July 2009.

<sup>2</sup> Due to machinery of government changes on 21 February 2011 (see Public Service Department Arrangements Notice No.1 2011), changes occurred to a number of Queensland Government departments. Consequently, the functions of the Coordinator-General in the Department of Infrastructure and Planning (DIP) was transferred to the Department of Employment, Economic Development and Innovation (DEEDI). Also the Planning Section of DIP became the Department of Local Government and Planning.

### 3.3.3 Public notification

In accordance with the statutory requirements of sections 42, 46 and 52 of the EP Act, public notification of the draft TOR and EIS and public comment periods was made through notices in The Courier-Mail, Mackay Daily Mercury, Miners MidWeek and on the department's website.

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

- The department's website
- The department's Customer Services Centre, 160 Ann Street, Brisbane
- The department's office, 400 George Street, Brisbane
- The department's office, 99 Hospital Road, Emerald
- Isaac Regional Council, Moranbah Town Library, Grosvenor Complex, Bachelor Parade, Moranbah
- Vale Australia Pty Ltd, Level 1, 11 Wood Street, Mackay
- Vale Australia Pty Ltd, Level 11, 100 Creek Street, Brisbane.

Copies of the draft EIS were available for purchase from URS Australia Pty Ltd.

## 3.4 Matters considered in the EIS assessment report

Section 58 of the EP Act requires that an EIS assessment report consider the following:

- a. the final TOR for the EIS
- b. the submitted EIS
- c. all properly made submissions and any other submissions accepted by the chief executive
- d. the standard criteria
- e. another matter prescribed under a regulation.

These matters are addressed in the following subsections.

### 3.4.1 The final TOR

All of the matters listed in the final TOR, issued on 1 February 2008, were considered when preparing this EIS assessment report. While the TOR was written to include all the potential major issues associated with the project, they were not exhaustive, nor were they to be interpreted as excluding other matters from consideration in the EIS. 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 were addressed in the EIS, those matters have also been considered in this EIS assessment report.

### 3.4.2 The submitted EIS

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

- the EIS that was made available for public submissions on 3 July 2009
- properly made submissions on the EIS
- a supplementary report to the EIS received by the department on 6 December 2010, titled 'Ellensfield Coal Mine Project, Environmental Impact Statement Supplement, December 2010' which included the response to submissions on the EIS and amendments to the EIS
- comments on the supplementary report to the EIS, provided to the proponent as Attachment 1 of Notice of extension of decision period, dated 3 March 2011, including comments provided by 14 advisory body members, organisations and the public on the EIS supplementary report

- a supplementary report received by the department on 15 July 2011, which included the response to comments on the supplementary report and amendments to the EIS
- comments on the supplementary report to the EIS dated 12 August 2011
- a supplementary report provided by the proponent on 21 September 2011
- comments on the supplementary report to the EIS and additional information dated 21 October 2011
- a supplementary report provided by the proponent on 23 December 2011
- comments on the supplementary report dated 3 February 2012
- a supplementary report to the EIS received by the department on 11 September 2012, titled 'Ellensfield Coal Mine Project, Environmental Impact Statement, Update Report, September 2012' which included an update of the EIS information previously submitted on 3 July 2009, to reflect additional biophysical impact assessments related to a revised mine plan.

The department accepted 17 submissions on the EIS including from:

- Department of Communities
- Department of Community Safety
- Department of Employment, Economic Development and Innovation
- Department of Transport and Main Roads
- Queensland Health
- Queensland Police Service
- Queensland Treasury
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC)
- Mackay Regional Council
- Isaac Regional Council
- Fitzroy Basin Association
- Construction, Forestry, Mining & Energy Union and
- a member of the public.

The department also made its own submission on the EIS.

All submitters were given the opportunity to provide a follow-up response to the department on their view of the suitability of the proponent's response to their respective submissions.

### 3.4.3 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 department has considered the standard criteria when assessing the project.

### 3.4.4 Prescribed matters

Section 58 of the EP Act requires that the following matters prescribed, 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

- section 60, activity involving storing or moving bulk material
- section 62, activity involving acid-producing rock
- section 64, activity involving indirect release of contaminants to groundwater.

### 3.4.5 Notifiable activities

The EIS identified and listed the following notifiable activities under schedule 3 of the EP Act that would apply to the project:

- Notifiable activity 23—Metal treatment or coating
- Notifiable activity 29—Petroleum product or oil storage

The project will be required to provide notification to the Contaminated Lands Register for all notifiable activities and the identified notifiable activities should be clearly identified and listed in the EM plan. Any notifiable activity, as defined under 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 project's tenures. These matters were adequately addressed in the EIS.

## 3.5 *Environment Protection and Biodiversity Conservation Act 1999*

On 16 August 2007, the project was referred (Ellensfield Coal Mine EPBC 2007/3643) under the EPBC Act to the (then) Commonwealth Department of Environment and Water Resources. On 14 September 2007, the project was declared to be a controlled action with the controlling provisions relating to listed threatened species and ecological communities (sections 18 and 18A of the EPBC Act).

This EIS process is accredited for the assessment under Part 8 of the EPBC Act in accordance with the agreement between the Commonwealth of Australia and the State of Queensland (the bilateral agreement) relating to environmental impact assessment. The Commonwealth was included as an advisory body for the assessment of the project and provided its comments on the draft TOR and EIS documents. A copy of this report will be given to the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities to assist in making a decision on the project under the EPBC Act.

MNES are further discussed in section 4.15 of this report.

## 4 Adequacy of the EIS in addressing the TOR

### 4.1 Introduction

The EIS provided an adequate introduction to the project, its objectives and scope. It adequately identified the necessary approvals and outlined the assessment and approvals process.

### 4.2 Regulatory approvals

The EIS provided an adequate summary of the purpose of legislation and regulatory approvals required for the project.

**Table 2 Approvals required for the Ellensfield Coal Mine Project**

Approval	Legislation (administering authority)
<b>Commonwealth legislation</b>	
Approval to undertake action that may impact on a matter of national environmental significance (nationally-listed threatened species and ecological communities). Refer to section 3.5 <i>Environment Protection and Biodiversity Conservation Act 1999</i> for details.	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Department of Sustainability, Environment, Water, Population and Communities)
<b>State legislation</b>	
Environmental authority (mining activities)	<i>Environmental Protection Act 1994</i> (Department of Environment and Heritage Protection)
The project requires leases to be approved for mining lease application 70393.	<i>Mineral Resources Act 1989</i> (Department of Natural Resources and Mines)
Water licences (taking or interfering with the flow of water from an aquifer and using water for the construction of bores for groundwater monitoring, dust suppression, dewatering and subsidence that intersects watercourses). Diversion of a defined watercourse.	<i>Water Act 2000</i> (Department of Natural Resources and Mines)
Clearing permits, for relocating any threatened species. Taking of listed species. Protected Plants Clearing Permit (Nature Conservation (Protected Plants) Conservation Plan 2000 A Species Management Plan must be submitted to the department for approval for tampering with breeding places (section 332 of the Nature Conservation (Wildlife Management) Regulation 2006 Rehabilitation Permit (spotter catcher endorsement) (section 207 of the Nature Conservation (Wildlife Management) Regulation 2006 Damage Mitigation Permit removal and relocation (section 181 of the Nature Conservation (Wildlife Management) Regulation 2006	<i>Nature Conservation Act 1992</i> (Department of Environment and Heritage Protection)
Activities that are associated with the mining lease that	<i>Sustainable Planning Act 2009</i> (SPA) (Isaac Regional



may occur outside the mining lease.	Council)
Cultural Heritage Management Plan (CHMP)	<i>Aboriginal Cultural Heritage Act 2003</i> (Department of Natural Resources and Mines)

The EIS did not conclusively state if approvals were needed for the following:

- dams and levees (*Water Supply (Safety and Reliability) Act 2008*)
- storage of flammable and combustible liquids (*Dangerous Goods Safety Management Act 2001* and SPA)
- for on-mining lease infrastructure development permits may be required for plumbing and drainage works (SPA and *Building Act 1975*).

## 4.3 Project need and alternatives

The EIS adequately described the need for the project and briefly outlined the social, economic and environmental benefits and costs and discussed project alternatives. The EIS considered the principles of ecologically sustainable development (ESD) where they were incorporated within the project. The positive and negative impacts, mitigation and management measures and environmental protection commitments of the project were addressed in later sections of the EIS.

## 4.4 Project description

The description of the project has been revised on two occasions since the EIS was initially submitted. The proponent provided details on the components of the project that have changed and the reason for the change. A brief outline of the project is in section 2 of this report.

## 4.5 Climate

The EIS adequately described the local climate with regard to how the climate could affect the potential for environmental impacts and the management of operations at the site. The principal aspect is the effect of seasonal rainfall on water management on site and consequential need for management to prevent the release of unauthorised contaminants from the site.

## 4.6 Land

The EIS adequately described those aspects of the site and project related to the existing and proposed qualities and characteristics of the land. The following subsections address those qualities and characteristics in more detail.

### 4.6.1 Land disturbance

The project will result in significant land disturbance. The underground operation would be accessed by two surface drifts (via box cuts); the man and materials drift and the conveyor drift located in the north western corner of MLA 70393. Approximately 271 ha of land will be directly disturbed by clearing activities associated with the construction and operation of the MIA, including the power generation substation pad, raw water dam and mine water dams and the haul access road. Topsoil will be removed from construction surfaces to build the haul road, MIA building foundations and drift entry (box cut) and stored in appropriately managed stockpiles for rehabilitation purposes. Road base construction material is planned to be sourced from the neighbouring Broadlea quarry. The EIS identified that waste rock material from drift entry development was not suitable for construction material and would be stored appropriately on site for rehabilitation fill for the drift entry at the end of mine life.

The underground operation would result in subsidence that would result in a change the local topography and surface water drainage patterns of the site. Of the project area, 931 ha would be subject to the impacts of subsidence, at a modelled maximum predicted subsidence of 2950 mm. The EIS stated that subsidence impacts at the project site will result from surface movement, compression or tension cracking and hydrology changes. These impacts would inturn result in the ponding of surface water (including in-channel and overland flow ponding),

changes in the flows of watercourses including sediment load, bank erosion and the potential loss of vegetation habitat (through root shearing and changes in soil structure and moisture) and fauna habitat through impacts on flora communities within subsidence zones. The EIS subsidence model predicted subsidence of 50 mm beyond the boundary of MLA 70393 at a maximum subsidence. The EIS stated 89.35 ha of remnant vegetation would be impacted from subsidence and surface infrastructure clearing. The EIS stated that site preparation clearing would directly impact approximately 41 ha of remnant vegetation, 4.76 ha of remnant and high value regrowth (HVR) and less than one per cent 'of concern' communities across the site. Additional direct disturbance would result from potential watercourse erosion measures where changes in watercourse flows (predicted to be caused by subsidence impacts) would initiate erosion.

#### 4.6.2 Land use

The dominant land use within the project area is currently low intensity beef cattle grazing. The greater part of the of the project area lies within the western portion of the Wotonga Pastoral Lease, while a small area lies within the northern portion of the Broadlea Pastoral Lease. The EIS stated that cattle grazing agistment arrangements will cease within the MIA and other areas directly affected by mining activities once the project commences. The EIS stated that the project site is located in an area surrounded by mining operations, and the proposed mining use reflects the predominant land use for the immediate surrounding area. A 132 kV Queensland Electricity Transmission Corporation electricity easement traverses the project area from the north-east corner to the south-west corner. There are no buildings or structures within the project area, however there is a stock yard, dams, fences, and vehicular access tracks traversing the site. The EIS stated that the majority of the project area has been extensively cleared for pasture and improved for grazing purposes with introduced Buffel Grass (*Cenchrus ciliarus*). Since 2005, activities associated with mining exploration have been undertaken on the site. The EIS identified the Barada Barna Kabalbara and Yetimarla People #3 (BBKY#3) and Barada Barna Kabalbara and Yetimarla People #4 (BBKY#4) as the Indigenous Traditional Owners representing the Indigenous cultural heritage values of the project area. A cultural heritage management plan (CHMP) was finalised and signed by all relevant parties and their representative on 15 September 2008. Indigenous cultural heritage survey work was undertaken in accordance with the draft CHMP. Indigenous cultural heritage matters are further discussed in section 4.14 of this report.

The EIS included a land suitability assessment of land uses for each soil type identified on the project site. The EIS stated that the resultant post-mining land use for the mine site would be low intensity grazing, with minor areas of native habitat. The EIS did not quantify the area of native habitat. The EIS stated that no good quality agricultural land (GQAL) was identified within the project area.

Land suitability classes 2, 3, 4 and 5 (grazing) were identified on the proposed site, where land suitability Class 1 is the highest through to Class 5 the lowest. The EIS stated that 46 per cent of the project land (1542 ha of a total of 3388 ha) was assessed as Class 2 land with minor limitations suitable for grazing and improved or native pasture. Approximately 95 ha (35 per cent of total) of that Class 2 land would be disturbed by the mine infrastructure and further significantly larger area of Class 2 land would be undermined and subsided. No Class A Crop Land or Class B Limited Crop land were identified on the project site.

The EIS stated that the project will result in no permanent alienation or degradation of land suitability of grazing land from the pre-mining land use. Nevertheless the area will experience landscape modification for example through impacts of subsidence at the end of the mine operations.

The EIS assessed that approximately 204.2 ha of mine disturbed land will be rehabilitated. All areas that will be rehabilitated will aim to provide stable, gently undulating free draining landforms with a self-sustaining vegetation cover with pre mining topography. Progressive and final rehabilitation measures will aim to provide stable final landforms supported by pasture grass species to support grazing post mining.

The EIS did not provide a finalised rehabilitation management plan (RMP), rehabilitation monitoring program, decommissioning and post closure plan for areas to be disturbed by mining activities. The success or failure of rehabilitated lands disturbed by mining activities will be measured against yet to be agreed outcomes and rehabilitation completion criteria for land suitability, land use, landform stability and land contamination. Access of stock to the rehabilitated tops of the MWD should be considered in any rehabilitation plan to improve the realisation of the stated aim of land use. Rehabilitation management is further discussed in section 4.20 of this report.

### 4.6.3 Soils and land suitability

The soils and land suitability assessment were comprehensively discussed the EIS. The EIS provided sufficient detailed information on land resources to determine project area soil type distributions, land suitability, soil erosion, rehabilitation potential and stormwater runoff quality.

The EIS concluded that all soil and overburden material and its use as a topsoil growth layer would be limited without suitable control measures. The EIS assessed that many of the soils on site were sodic (saline), especially identified dark and brown clays that exhibit a high potential for erosion, dispersion and surface hard setting. Consequently, the rehabilitation design, management and monitoring plans and the site water management plan would all need to include appropriate environmental protection measures and commitments to reduce landform erosion, particularly if these disturbed soils are in the vicinity of drainage lines.

The EIS stated that all areas disturbed by surface mining activities, including the MIA, raw water dam, mine water dams and haul roads and areas impacted by subsidence will be rehabilitated to a stable landform with self-sustaining vegetation cover, primarily for the intended land use (cattle grazing) and native vegetation. The stability of the final landform for future grazing will be limited by the slope length and angle of the final landform, soil depth and altered soil moisture profile.

The EIS undertook a pre- and post-mining agricultural land suitability assessment for the mine disturbance footprint area (excluding subsidence), including the MIA and haul road. The EIS identified that there would be no significant changes in post-mining land suitability for grazing. The EIS identified approximately 3388 ha of land classed as agricultural land suitability classes Class 2 C1 (1542 ha—46 per cent), Class 3 C2 (852 ha—25 per cent), Class 4 C3 (702—21 per cent), and Class 5 D (292 ha—nine per cent) on the MLA. Approximately 46 per cent of suitable agricultural land (1542 ha of the total area 3388 ha) within the project area was assessed in the EIS as suitable for low intensity grazing. The EIS stated that MIA, raw water dam, mine water dam and haul would impact approximately 271 ha of these agricultural land suitability classes' on the project site. Of this 271 ha, approximately 243.4 ha of grazing land will be directly disturbed by mining activities with approximately 204.2 ha requiring some form of rehabilitation. The EIS stated that a further 931 ha of land would be subsided to some extent. The EIS concluded that there would be no reduction in the land suitability classifications for disturbed areas provided appropriate land rehabilitation mitigation measures are implemented. The EIS concluded that the project is not expected to result in any degradation of land suitability following the completion of the rehabilitation and decommissioning strategy at the end of mine life.

### 4.6.4 Resource utilisation

The EIS adequately addressed resource identification, recovery and utilisation, stating that the mine plan is based on maximum coal resource recovery from the Leichhardt coal seam. The EIS assessed a number of underground mining techniques to recover the resource. The EIS concluded the a combination of longwall mining extraction system and bord and pillar mining method would result in a greater percentage of the coal seam being available for recovery. Some minor seams were also identified above the Leichhardt seam. The EIS concluded that these seams were thin, discontinuous and of poor quality and as such were deemed uneconomic and would not be mined. Coal resource sterilisation was minimised through locating the MIA and the MWD where they will not sterilise any recoverable coal reserves.

The EIS estimated that quantities of product coal and wastes over the life of the mine as:

- total ROM—48.3 Mt
- total product coal—40.2 Mt

- total waste (rejects and tailings)—8.1 Mt
- mean yield—82.3 per cent.

The Department of Natural Resources and Mines will further review the resource stewardship aspects of the project as part of the *Mineral Resources Act 1989* as a pre-requisite for the grant of the mining lease. This would involve a review of the proposed initial development plan for the project, as required under Part 7AA of the *Mineral Resources Act 1989*.

#### 4.6.5 Land contamination

The EIS provided sufficient information to address management of potentially contaminated land. However, the EM plan provided with the EIS did not provide a commitment to undertake contaminated land investigations at decommissioning.

The project area has been partially cleared and used for low intensity beef cattle grazing. The EIS included a preliminary site investigation (PSI) of the project area to identify and assess the risks of environmental harm on the site as a result of past and current land use practices. The EIS included a search of the Environmental Management Register (EMR) and Contaminated Land Register (CLR). Two of the grazing leases associated with the project site are listed on the EMR for mining wastes and fuel storages. These leases have been subdivided and the areas of contamination are off the project site.

Areas of interest were identified on the project site during a site inspection, they included old farm machinery, cattle burial site, unused musterers camp, drums, cement lined tanks and groundwater bore, and cattle yards. The EIS concluded that no further investigation of the site is warranted as the areas of interest were deemed to be of low risk.

The proposed mining activities will result in some contamination of land. The EIS proposed a range of mitigation measures to reduce the potential negative impacts to land and waters from operational activities, including accidental spills from the storage and handling of hydrocarbons and chemicals.

The EIS identified the following notifiable activities that may be conducted on the site, including:

- Notifiable activity 23—Metal treatment or coating
- Notifiable activity 29—Petroleum product or oil storage.

When updated, the EMR and CLR will provide information about the site that is searchable for any future owners or users of the site.

The EIS included a commitment that the proponent must inform the department that land has been or is being used for a notifiable activity.

#### 4.6.6 Landscape character and visual amenity

The project is located wholly within the Isaac Regional Council area. The EIS characterised the project site as a gently undulating rural valley defined by steep-sided 50 m to 100 m tree-covered ridge lines to the north, east and south, with a series of isolated hills, also covered in remnant vegetation, in the western portion of the project area surround the site. The landscape character of the project area is defined by the combination of physical landform, vegetation, land uses and development. The project footprint covers a total area of approximately 1202 ha with the majority subject to underground mining. The area of surface disturbance subject to MIA activities and subsidence is approximately 271 ha and 931 ha respectively. The mine site is an irregular hendecagon (11 sided polygon) shape that would cover an area approximately seven km by seven km or 3388 ha. There is a haul road corridor that extends approximately 11 km south from the proposed MIA and will connect to the Broadlea mine access road.

The EIS described overburden waste emplacements, associated with the adjacent Burton open-cut coal mine to the north-west and Broadlea mine to the south-west that are visible from various locations within the south-western corner of the project area, particularly where views are not screened by remnant woodland vegetation.

The EIS described drainage lines as visually distinctive landscape features within the project area. Spade Creek forms a wide multi-channelled catchment with visually distinctive remnant riparian vegetation still evident along drainage lines with grassland and shrubland on higher ground between drainage lines. Numerous smaller tributaries

drain into Spade Creek, Hat Creek, Bullock Creek and Alpha Creek that flow south-west in Teviot Brook eventually draining to the Isaac River. Bullock Creek, together with a minor tributary, drain the northern and north-western portion of the project area. The site has been changed by human activities including extensive areas (approximately half of the project area) previously cleared for cattle grazing. Cattle grazing activities are likely to continue on the non-operational areas of the project site. Coal mines bounded by or in close vicinity to the project include the Burton open-cut coal mine to the west and north-west, Broadlea open-cut mine to the south-west, South Walker Creek open-cut mine and Carborough Downs underground mine to south.

A 132 kV high voltage transmission line on steel lattice pylons forms a visually constructed element across the centre of the project area with a maintenance track running parallel to the powerlines. The powerlines and associated structures would be re-aligned to traverse the areas of subsidence. This will reduce the interruption period to power and data consumers downstream.

During the operational phase, the project will include a range of aboveground infrastructure and mining activities that will influence visual amenity and landscape character. The proposed MIA and associated mining activities will negatively impact on the visual quality, amenity and landscape character of the site. The landform changes to be created will result from the disposal of the drift/box-cut spoil, underground rejects material, raw water dam and waste water dam will change to the amenity and landscape character of the site during the life of the mine. The location of the mine surface facilities would predominately be located in the north-western section of the project area. The EIS stated that no existing landforms will be modified on the site. However, this statement is inconsistent with the 1202 ha of predicted changes to local topography within the project area as a result of impacts associated with disturbed and subsided land. Following the end of mining operations, the building features associated with infrastructure activities will be decommissioned and removed. Vegetation on the rehabilitated area will take a significant time to establish and may soften the visual impact of the disturbed and subsided land.

Waste material from the drift entry (box cut) and longwall operations would be disposed of by placing it against the existing natural landform along the northern boundary of the project area. The majority of material will be disposed of through the creation of the waste emplacement facility (WEF). The final elevation of the WEF landform will be less than 10 m above the natural ground level. The EIS stated that the flat top of the new landform will be designed to replicate existing landform features in the area with slopes in accordance with industry best practice landform design criteria.

The negative impacts on visual amenity and landscape character from activities of the project and its residual physical features would be mitigated to a small degree by:

- the generally enclosed visual character of the project landscape and infrastructure area within the overall landscape, and the absence of surrounding/adjoining homesteads, public roads or homesteads with potential views of the landscape change. The EIS visual assessment concluded that the only people who will see the project operations will be those working at the mine, adjacent mine or individuals engaged in managing grazing activities on the project area
- simulation of the projects final landform design to replicate existing natural features in the area
- vegetation on rehabilitated landforms and site remediation works which could when established provide some screening and softening of the potential mining impacts to minimise the visual contrast between the new landforms and the adjoining landscape character.

## 4.7 Transport

### 4.7.1 Road

The EIS stated that approximately 7500–10,000 truckloads of ROM coal per year would be carried along a private haul road through the adjacent Broadlea Coal Mine to the CDCM CHPP.

The EIS assessed the transport impacts of required infrastructure and movement of the workforce for the construction and operational components of the project along the Peak Downs Highway. The EIS included a road-use impact assessment, including a road-use and traffic management plan. Materials and equipment that would be delivered to the mine during construction include mining equipment, building supplies, mechanical plant and equipment, fuel, concrete, steel and gravel. During operations, materials delivered would include fuel, explosives, spare parts and office consumables.

The project would initially employ a construction workforce of approximately 160 employees then an operational workforce of 350 persons. The shift rotation is likely to be seven days on, seven days off, two or three staggered shifts, rotating roster. The majority of the operational workforce will likely reside in Mackay or Moranbah and use either the Bus-In-Bus-Out (BIBO) arrangements or private vehicles to travel to the existing QRI Coppabella and MAC Coppabella camp accommodation. Those camps would likely accommodate up to 90 per cent (or 350 personnel) of the project's employees. The remainder would likely be accommodated in Moranbah in proponent owned and managed accommodation. Those in the camps would be transported between the camps and the mine by dedicated shuttle buses with a capacity of 20 or 40 seated persons. The journey would be approximately 30 km each way, south-west along the state-controlled Peak Downs Highway to the privately owned and maintained Carborough Downs–Broadlea–Ellensfield Access Road. The EIS stated that the potential accident risk of that arrangement was low.

Any necessary permits for any excess mass or over-dimensional loads associated with the project will be required prior to the commencement of any project construction works. Access to the project would be via the existing CDCM and Broadlea Coal mine access intersection on the state-controlled Peak Downs Highway. The EIS stated that no major upgrade would be required for the state controlled Peak Downs Highway, other than pavement rehabilitation works. The EIS included a commitment to contributing funds to ameliorate those project pavement impacts. The EIS concluded that the overall traffic generated by the project during the operational phase would account for less than five per cent of the average daily traffic on the Peak Downs Highway and that the potential accident risk was low.

The EIS stated that the only safety upgrade that would be required to the Peak Downs Highway intersection would likely be installation of Category V5 lighting. The EIS stated that further consultation with DTMR will be undertaken and should additional lighting be deemed necessary, it shall be installed in accordance with the appropriate standards.

It is recommended that the proponent continue to liaise with DTMR to discuss and resolve the outstanding issues.

### 4.7.2 Rail

Stockpiling and export of product coal will be through the CDCM coal handling facility using the existing rail load-out directly to the Dalrymple Bay Coal Terminal (DBCT) via the Goonyella Coal Chain system. The EIS stated that no modifications of capacity of either the product coal stockpile or train load-out nor the existing rail corridor would be required. The EIS stated that average coal production would require approximately one extra train movement per day using the 9600 t load carrying capacity of Queensland Rail (QR) rolling stock. The EIS states that the proponent's current agreement ('take or pay') with QR is sufficient to allow production from both the CDCM and ECM concurrently. The EIS states that no amendment to the existing CDCM EA would be required for this component of the project.

### 4.7.3 Port

The EIS stated that the preferred port for the export of product coal from the project is Dalrymple Bay Coal Terminal (DBCT), but that Abbot Point Coal Terminal may become an alternative for the project. The EIS stated that the proponent's current port allocation would accommodate both CDCM and the project's production.

The anticipated additional coal product volume would equate to approximately 60 additional shipping movements (based on 80 kilotonne (kt) per ship) per year from the DBCT, an approximately 5.1 per cent increase of current DBCT operations.

### 4.7.4 Air

The final TOR did not require transport via air to be discussed.

The EIS stated that the majority of the construction and operational workforce will be sourced locally and transported between camps or housing developments to site by buses.

## 4.8 Subsidence

The underground mining for the project would combine two principal methods; longwall and bord and pillar. The EIS stated that the extraction of coal using the bord and pillar mining method would not result in surface subsidence. However, the EIS also notes that project includes 22 longwall panels which would result in subsidence. The EIS stated that the extent to which subsidence impacts are expressed on the surface is dependent on:

- the type of the overlying strata
- the depth of the extracted coal seam
- the distance between the mining operation and the surface.

The EIS concluded that the maximum predicted subsidence for the longwall panels is approximately 3 m, being approximately 65 per cent of the thickness of the extracted coal seam (4500 mm). This would occur in the north-western area of the MLA where the depth of overburden is shallowest (i.e. less than 200 m).

The EIS stated that subsidence induced cracking on the surface would occur with individual surface cracks to have a maximum width in the order of 100 mm in the north-west corner of the site, and that subsidence related subsurface fracturing would result in direct hydraulic connection of surface waters to the underground mine. The EIS stated that other surface cracks of less than 50 mm were not considered significant and would naturally self-seal over time due to the clayey soils on the project site.

The EIS stated that subsidence impacts are predicted to occur beyond MLA boundary as a result of mining the longwall panel (LW307) close to the southern MLA boundary. The Department of Natural Resources and Mines (DNRM) has advised the department that predicted subsidence beyond the MLA boundary is not acceptable, not even with compensation agreements with adjacent landowners. On that basis the mine plan presented in the EIS is not acceptable.

It is recommended that a revised mine plan be developed in conjunction with DNRM to ensure that subsidence will be completely confined to the lease area before approvals are sought for the project.

A subsidence management plan (SMP) was developed to assess the potential for impacts on identified environmental values and to identify appropriate environmental protection, mitigation and management strategies.

The EIS stated that a pre-mining baseline survey, including a photographic record would be undertaken of specific reaches of potentially impacted stream channels on the project site. Further detailed surveys would be undertaken of potentially subsided reaches following subsidence.

The SMP assessed the potential impacts to:

- surface water values including:
  - changes to water flow patterns
  - changes to in-channel hydraulics and overland flow paths, including surface cracking, ponding of water, changes in sediment loads and bank stability

- groundwater values
- ecological values, including:
  - root shearing
  - changes to soil structure and moisture levels
  - loss of vegetation
  - loss of habitat to fauna through impacts on plant communities.

The DNRM recommended the SMP should be revised to include:

- details on how the monitoring program Index of Diversion Condition, as outlined in the Australian Coal Association Research Program (ACARP) Project C9068 would be implemented as part of the monitoring of streams and watercourses impacted by subsidence
- details on proposed preventative measures prior to subsidence of watercourses or drainage lines that may reduce or alleviate predicted significant increases in stream hydraulic parameters
- reviewing proposed channel regrading mitigation measures which as currently presented may have the potential to create greater instability to watercourses through the additional loss of riparian vegetation.

The revised SMP plan should consider using a multiple systems based approach incorporating engineered and non-engineered solutions within impacted water courses and their catchment.

## 4.9 Waste

The EIS identified that the project's major sources of waste with the potential to cause impacts to the environment and to human health and well-being include:

- mine waste that may produce poor quality, saline or acid water runoff/seepage including:
  - waste rock and overburden from the drift portal and MIA
  - coarse rejects and fine tailings (approximately 8.1 Mt over the life of the mine) which are the waste by-products from the CHPP process
- regulated wastes including, hydrocarbon contaminated wastes/materials, batteries, tyres, waste oils and oil drums, lubricants, brine waste, potable water treatment plant residues, chemical wastes including used and waste emulsions and coolants, cleaning chemicals, paints and resins, vehicle wash down waters and detergents and solvents from workshop activities
- general waste including, timber, trees and other vegetation from clearing, non-biodegradable material, packaging material, green waste and domestic waste
- recyclable materials including, paper, cardboard, glass, aluminium and scrap metal
- sewage waste including, sewage effluent and dried sewage sludge.

The EIS identified that the inappropriate management and disposal of wastes could lead to the to the contamination of land and water with potential adverse impacts on human and ecosystem health.

The EIS committed to managing waste generated by the project in accordance with the waste management hierarchy (i.e. avoidance, recycling, waste to energy and disposal) and relevant legislation, and to incorporate a program of best practice waste management, including the ongoing assessment of cleaner production and waste management opportunities for the life of the project. The EIS included a commitment to incorporate a waste tracking system in accordance with the regulatory requirement and applicable Australian standards to ensure any regulated waste will be removed off-site by an appropriately licensed contractor for disposal at an appropriately licensed facility.

The EIS did not provide a waste management plan (WMP) but committed to developing it. It is recommend that the WMP be developed and implemented prior to construction commencing on the project site.



The EIS committed to maintaining a register of all chemicals stored at the project and to the storage and handling of all flammable and combustible liquids in accordance with relevant standards.

Recommended waste management conditions have been provided in Appendix 1.

#### **4.9.1 Mine waste/waste rock and overburden**

Project ROM coal would be processed at the CDCM CHPP. The EIS stated that processing would generate approximately 8.1 Mt of mine waste (rejects and tailings), over the life of the mine. CHPP wastes will all be stored at CDCM, initially using existing waste emplacement facilities, however an additional waste emplacement facility will be required in the future. The EIS stated that topsoil, waste rock and overburden material excavated from the two drift entries would be stored on site for post mine rehabilitation purposes. No CHPP-generated mine waste would be stored at the project site.

The EIS provided CDCM joint venture (JV) in-principal letters of intent approval for toll-washing and emplacement of ECM waste at the CDCM site. The CDCM EA will require amendment to accept, process and manage ROM coal and coal washing waste from ECM. The EIS stated that the CHPP has sufficient production capacity to process the additional ECM project ROM coal on top of its other inputs.

Any future expansion or modifications of the CDCM JV operations would require a separate assessment and approval process, including an updated water management plan, EA and plan of operations amendments.

It is recommended that the EM plan detail a specific management regime for the appropriate disposal of potentially sodic or saline overburden and waste rock material recovered from the drift entry box cut.

#### **4.9.2 Regulated waste**

The EIS adequately addressed the management of regulated waste generated by the project. All regulated waste generated by the project would be segregated, stored and managed in accordance with relevant legislation and then collected and transport by a appropriately licensed contractor and disposed of or recycled at a licensed waste management facility.

#### **4.9.3 Sewage treatment**

The EIS stated that a 21 equivalent person capacity sewage treatment plant (STP) would be required to treat the projects effluent. The EIS did not provide detailed specifications for the STP or include an odour assessment. The EIS stated that treated effluent is intended to meet Class A effluent criteria and would be disposed onto a 1.5 ha effluent irrigation area. Approximately 2.8 ML would be disposed of annually. The chosen site was stated as having sufficient assimilative capacity and that effluent inputs combined with precipitation would not meet evapo-transpiration needs. Temporary storage of treated effluent would be required for rainy periods.

#### **4.9.4 Other waste**

The EIS adequately addressed the management of general and recycled waste generated by the project.

However, the EIS did not adequately address RO permeate release disposal, including details on any RO treatment additives generated by the project. It is recommended that the irrigation to land modelling be re-assessed for accuracy and that the proponent provide further details to the department on permeate discharge limits, RO treatment additives and review those conditions proposed in the EM plan in consultation with the department. The results of the re-assessment will need to be included in the final EM plan.

The potential impacts of disposal of raw water to land and Spade Creek were not adequately assessed in the EIS and would require full consideration prior to deciding whether to allow that activity through the EA.

## 4.10 Water resources

### 4.10.1 Surface water, water supply and storage

#### 4.10.1.1 Surface water

The EIS stated that the Fitzroy River catchment is the largest river basin on the east coast of Queensland. The basin's area comprises six major sub-catchments including, the Isaac River catchment. The Fitzroy River mouth is near Rockhampton and discharges to the Coral Sea. The project site is located in the headwaters of the Teviot Brook catchment approximately 16 km upstream of its confluence with the Isaac River. The drainage systems to Teviot Brook contribute to an overall catchment size of approximately 160 square kilometres (km<sup>2</sup>). Spade, Hat and Alpha creeks are identified ephemeral waterways within the project area that flow to the Isaac River. Spade and Hat creeks are defined as 'watercourses' under the *Water Act 2000*. The EIS stated that streams within the project area typically exhibited long periods of low or zero flows during which the streams can reduce to a series of waterholes. The EIS stated that billabongs such as those found in the lower reaches of Spade Creek, retain water for longer periods.

The EIS provided no flow records for any of the drainage lines and watercourses within the project area or the downstream watercourses of Bullock Creek and Teviot Brook, therefore stream flow characteristics statements in the EIS were based on only a desktop analysis. It is recommended that the proponent develop as a condition of the EA a baseline stream monitoring program including a receiving environment monitoring program (REMP) with reference site(s) whose condition is considered to be a suitable benchmark for the assessment and management of sites in a similar locality to enable specific trigger values to be set in the EA.

The environmental values of surface waters in the Isaac River catchment have been characterised by significant changes to the land use of the catchment. Extensive and widespread vegetation clearing within the catchment has occurred from past and current agricultural and coal mining activities. The EIS concluded that the waterways and associated riparian vegetation and aquatic ecosystem was a slightly to moderately disturbed system.

The project proposes to divert clean water from undisturbed parts of the catchment around the proposed mining operations in order to minimise the amount of surface runoff impacted by mining operations.

The EIS stated that channel beds and floodplains located directly over longwall blocks would subside approximately three metres from underground mining and that surface cracking would develop. The EIS stated that the surface depressions and cracking would impact on surface water resources and the morphological stability of watercourses.

Impacts on surface water resources would include the loss of surface flows to downstream watercourses from flows into surface and sub-surface cracks and ponding in channel beds or overland flow depressions. Where these cracks and ponded areas are large enough it can reduce the volume of water resources available to downstream users and the environment. The EIS stated that individual surface cracks are likely to have a maximum width of approximately 100 mm in the north-west corner of the site. That subsidence would result in direct hydraulic connection of surface waters to the underground mine due to subsurface fracturing within the portion of the mine with the lowest depth of cover, particularly the northern end of longwall panels LW101, LW102 and LW103. The EIS stated that other surface cracks of less than 50 mm were not considered significant and would naturally self-seal over time due to the clayey soils on the project site.

The EIS compared pre and modelled post subsidence topography along watercourses on the project site and concluded that localised morphological changes would occur in Spade Creek and Alpha Creek 2 resulting in increased water velocity, bed shear and stream power that would increase bank and bed erosion and sedimentation rates. The EIS proposed channel re-profiling measures and a subsidence monitoring program to manage and mitigate the effects of subsidence. The EIS predicted that ponded areas would be formed both in and outside watercourses as a result of subsidence and that retention of water within these ponded areas has the potential to adversely affect surface water flows.

The EIS proposed mitigation and management measures including locally re-profiling and regrading impacted stream sections to reduce rapid hydraulic changes.

DNRM considers that an investigation of preventative measures that could be adopted prior to subsidence of watercourses or drainage lines is required. That investigation should look to reduce or alleviate predicted significant increases in stream hydraulic parameters. DNRM is concerned by the potential impacts associated with elevated stream hydraulic parameters and the risk of proposed regrading mitigation measures to create greater instability to the watercourse, including through the loss of riparian vegetation from works associated with channel re-profiling.

The EIS did not make a commitment to include Index of Diversion Condition monitoring of streams and watercourses impacted by subsidence, as outlined in the ACARP Project C9068. That monitoring should be included in the proposed subsidence management plan (SMP).

It is recommended that these matters be resolved with DNRM prior to a decision is made whether to issue a draft EA being made.

The EIS included commitments to:

- install a stream flow and monitoring gauges on Spade Creek on the project site mining lease boundary
- prepare and implement an erosion and sediment control plan
- prepare and implement stormwater management plan prior to the commencement of construction activities on the project site.

The EA conditions proposed in the EM plan Water Schedule are not adequate. It is recommended that the proposed conditions be revised in conjunction with the department during the EM plan and draft EA development stage.

A final water management plan for the project has not been provided during the EIS. A water management plan is critical; it should identify sound water management practices for the operation of the mine and:

- clearly identify all potential impacts
- minimise the potential risks of contaminants being released to the environment
- include water quality monitoring for all storages, release points and receiving waters.

It is recommended that a water management plan be developed and implemented prior to the commencement of construction activities.

#### 4.10.1.2 Mine water management system

The proposed project mine water management system would consist of a series of interconnected runoff containment systems, water storages, pumps, transfer and reticulation systems along with a 1.5 ML per day on-site RO treatment system to produce permeate water designed to supply the majority of the project's raw water demand.

The EIS stated that mine-affected water would include groundwater from dewatering, underground mining operations, gas drainage associated water and water from the two mine portals and ROM pads. Mine-affected water would be pumped to a MWD designed and constructed as a series of interconnected storages including a primary 1000 ML cell and a secondary 225 ML cell.

RO treated clean water (permeate) would be stored in a 30 ML capacity water dam. Permeate quality is expected to be approximately 600  $\mu\text{S}/\text{cm}$  and would be further treated where required to meet drinking water standards. The RO treatment would produce waste including brine that would be stored in a 350 ML capacity dual cell brine dam. The brine waste is expected to be 80,000  $\mu\text{S}/\text{cm}$ .

The EIS estimated total water demand for the project as approximately 404.8 ML per year and that there would be a shortfall in supply for the project's raw water requirements in the early (first four years) of the mine life. The predicted shortfall would be supplemented by a new raw water pipeline from the existing supply allocation on CDCM.

The EIS modelled that reinjection into the goaf is possible into three longwall panels, while allowing for natural recovery, indicates that it is viable that 1 gigalitre (GL) be reinjected into the goaf once the mining is complete (over a 13-year period).

The EIS stated that if RO permeate production exceeded mine raw water requirements and where the MWD was at full capacity, then permeate would be firstly irrigated to a designated land area in accordance with EA conditions, or otherwise released to Spade Creek in accordance with EA conditions.

The EIS did not provide an adequate hazard category assessment of the raw water dam in accordance with the Manual for assessing Hazard Categories and Hydraulic Performance of Dams. The results of that assessment should be included in the EM plan.

#### 4.10.2 Groundwater

The EIS generally adequately addressed groundwater resource issues including:

- an assessment of groundwater inflow to longwall panels from coal seams
- compilation of site specific geological and hydrological data
- water quality information
- local groundwater use
- local and regional groundwater resources
- groundwater contamination
- potential impacts on environmental values
- potential impacts of underground mine dewatering on regional groundwater levels
- whether subsidence cracking will create hydraulic connectivity between the mine and the base of overburden aquifers and alluvium sediments above the shallow mine blocks
- groundwater monitoring.

The EIS assessed and modelled the groundwater resource of the project and surrounding area to predict changes in groundwater quality and quantity, standing water levels and the potential impacts of dewatering on the local and regional groundwater values. The EIS concluded that mine dewatering operations would reduce both water-table levels and groundwater flows.

The EIS stated that the zone of most marked drawdown was identified in the northwest of the site, where subsidence is expected to be higher due to the shallower underground mining operation in this area. The EIS stated that that groundwater extraction of between 5.59 GL to 6.73 GL would be required over the life of the mine (an average of 0.3 GL to 0.35 GL per year).

The EIS stated that subsidence would result in direct hydraulic connection of surface flows to mine areas due to subsurface fracturing within the shallowest portion of the mine with the lowest depth of cover, particularly the northern end of longwall panels LW101, LW102 and LW103.

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

The EIS stated that groundwater quality in the overburden and coal seam aquifers is poor, including variability from saline brine to brackish. Groundwater salinity ranged from 5000  $\mu\text{S}/\text{cm}$  to 25,000  $\mu\text{S}/\text{cm}$ , with 80 per cent of groundwater records showing salinity greater than 5000  $\mu\text{S}/\text{cm}$  and the majority of samples tested (64 per cent) greater than 10,000  $\mu\text{S}/\text{cm}$ . The EIS stated that groundwater proposed to be dewatered was not suitable for human consumption, generally too saline for livestock watering and limited to industrial use.

The EIS notes that there are no operational private or farm bores in use within the MLA. The EIS stated that within the broader area the only groundwater use is from the Broadlea borefield, located approximately 15 km to the south. That borefield draws from a basalt aquifer that does not extent into the project area. The EIS concluded that no groundwater supply bores would be affected by the lowering of the predicted groundwater levels, however it committed to negotiate 'make good' arrangements where the monitoring program shows that mining activities are impacting on groundwater resources.

A groundwater monitoring program (GMP) was not provided in the EIS. The EIS included a commitment to developing a comprehensive baseline groundwater monitoring network and program prior the commencement of mining operations to detect any change in the groundwater resource levels and quality due the mining activities.

DNRM has reviewed the groundwater conditions proposed in the EM plan and advised that they are not adequate. It is recommend that the groundwater resource matters including, monitoring and trigger values be resolved in conjunction with DNRM.

Consequently, recommended groundwater conditions for the draft environmental authority are not outlined in Appendix 1.

## 4.11 Air quality

The project would be located approximately 35 km north-east of Moranbah and approximately 175 km south-west of Mackay in a sparsely populated rural area. The EIS identified two sensitive receptors in the vicinity of the project area, the unoccupied Ellensfield homestead located approximately 5 km north east of the project and the occupied Red Hill homestead located approximately 12 km to the west north west. The major sources of particulate emissions to air from the project would include:

- operating mining vehicles and heavy earthmoving equipment
- drilling, blasting and extracting an estimated 210,000 m<sup>3</sup> of overburden material for construction of the two surface drifts
- dust from transporting and stockpiling waste rock and fill material in the construction process
- gas emissions from mobile plant and equipment exhausts
- wind erosion from stockpiles and waste rock emplacements
- vehicle movements on unsealed haul roads
- diesel and gas powered electricity generators.

Air quality impacts from the project were assessed through estimations of emissions from typical operating conditions and dispersion modelling from emissions on the identified sensitive receptors and the local area.

The EIS estimated that the project would require 18.5 MW of electrical power, initially six MW of diesel powered generators for construction activities, then construction of a 66 kV line from CDCM as the primary power source and finally construct a 12.5 MW gas powered generation facility to utilise coal seam gas from onsite gas drainage program. This would form the primary source of power for the project, with back up from the CDCM network and diesel powered generated tertiary supplies.

The EIS did not provide specific information on the electricity generation plant configuration and location of release points and flaring system. The EIS committed to providing the necessary information to the department in the detailed phase of the project.

The EIS provide adequate information on air quality objectives and goals set to protect air environmental values and outlined suitable mitigation and management measures to protect air quality values. The EIS stated that while emissions from the combustion of diesel fuel would produce sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and trace quantities of volatile organic compounds (VOC), the emissions of dust, NO<sub>2</sub> and carbon monoxide (CO) were the primary sources of air quality impacts from the project. The EIS concluded that emission from the project would comply with air quality guidelines for total suspended particulate (TSP), PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and CO.

The EIS included a satisfactory assessment of potential greenhouse gas (GHG) emissions using the National Greenhouse Accounts Factors published by the Commonwealth Department of Climate Change and Energy Efficiency.

The direct and indirect GHG emissions generated from the project include:

- fuel (diesel) burning in heavy mining earthmoving equipment and light vehicles
- combustion emissions from burning coal seam gas and diesel fuel for power generation and in the flare(s)
- on-site electricity consumption

- use of explosives for blasting for the development of the two mine access portals
- methane emissions (fugitive) from coal seam gas
- land clearing (e.g. burning of vegetation).

The draft EA conditions proposed in the draft EM plan Air Schedule are not adequate. The recommended conditions for management of environmental impacts of air emissions are outlined in Appendix 1.

## 4.12 Noise and vibration

The EIS adequately addressed the noise and vibration matters raised in the TOR. There are two noise sensitive places (farm homesteads) within 12 km of the site. The EIS noted that each of the sensitive receptors was already subject to vibration, including from blasting and movement of large mining machinery from an existing mine approximately 15 km west of the project area.

The EIS stated that construction noise sources would include vegetation clearing, MIA site preparation and levelling, pad installation and the construction of dams, roads, buildings and drift portals. Operational noise sources would include heavy vehicle equipment including dozers and ROM coal haul trucks, the electricity generation plant and conveyors.

The EIS stated that noise generated by construction and operational activities would comply with noise criteria at the nearest and most sensitive places. Modelling of noise levels undertaken for the EIS concluded that the noise sensitive places would not be impacted by noise or vibration from the project at any time of day, evening or night during construction and operational operations.

EA conditions proposed in the draft EM plan Noise and Vibration Schedule are not adequate. The recommended conditions for the management of noise impacts are outlined in Appendix 1.

## 4.13 Ecology

### 4.13.1 Flora and Fauna

The EIS stated that the majority of the vegetation within the project area has been extensively modified as a consequence of historical vegetation clearing practices for beef grazing activities resulting in the loss of, or alteration to, the majority of vegetation communities. Exotic plant species including buffel grass (*Pennisetum ciliare*) have been introduced deliberately for cattle grazing on the project site.

The EIS stated that the project would impact on vegetation and a fauna values through site preparation and clearing works and the construction of the mine surface infrastructure areas including dams, vehicle access roads, fences, gas drainage pads, electricity transmission lines and pipelines. Direct impacts to plant and animal species and communities include to remnant, high value regrowth (HVR) and non-remnant vegetation communities and fauna species, including invertebrates and insects. Impacts to flora and fauna would result in further fragmentation of vegetation and habitat, corridor loss, mortality, light pollution, increased competition and predation from exotic species, vehicle collisions, loss of habitat and breeding places, including the removal of habitat structure such as trees, shrubs, groundcover, rocks, logs and leaf litter.

The EIS stated that indirect impacts on vegetation would occur as a result of dust, erosion, altered water flows, weed infestation, soil exposure and an increase in light penetration.

The proponent undertook a desktop analysis and ground truthing to identify 227 plant taxa, representing 161 genera from 63 families including eight remnant and three non-remnant vegetation communities on the project site. The EIS reported that this represents a relatively high floral diversity. The EIS stated that that a total (including exotic fauna) of 84 bird, 31 mammal, 12 amphibian, 16 reptile, and two fish species were recorded for the site. A further six microbat species were provisionally identified on site, but positive identification to species level could not be confirmed.

The EIS identified potential impacts of the project on nature conservation values, including:

- approximately 89.35 ha of remnant vegetation would be cleared or disturbed through subsidence. Disturbance arising from surface infrastructure would impact approximately 41 ha
- approximately 4.76 ha of Brigalow (RE 11.4.9 ) vegetation listed as 'endangered' under the *Vegetation Management Act 1999* (VM Act). The EIS concluded that the loss would be negligible as the brigalow on the site comprises small disjunct areas which have been significantly disturbed with degraded habitat values resulting from historical grazing pressures
- species listed under the NC Act as vulnerable:
  - squatter pigeon (southern) (*Geophaps scripta scripta*)—known to occur within project site
  - *Xerothamnella parvifolia* (shrub)—known to occur within the project site
- species listed under the NC Act as near threatened:
  - *Cerbera dumicola* (shrub)—known to occur within the project site
  - little pied bat (*Chalinolobus picatus*)—'probable' recording on the project site
- state-significant biodiversity values (SSBV) of endangered and of concern including:
  - 1.02 ha of *Eucalyptus populnea* (RE 11.3.2) woodland on alluvial plains
  - 5.77 ha of *Eucalyptus tereticornis* (RE 11.3.4) and/or *Eucalyptus* spp. tall woodland on alluvial plains
  - 0.38 ha of *Acacia harpophylla* (RE 11.4.9) shrubby open-forest to woodland with *Terminalia oblongata* on Cainozoic clay plains
  - 4.38 ha of *Acacia harpophylla* and/or *Casuarina cristata* (RE 11.9.5) open forest on fine-grained sedimentary rocks - HVR containing endangered regional ecosystems and
  - 27.55 ha of watercourse values - Remnant vegetation associated with watercourses with the specified distance from high banks of the relevant regional vegetation management code.

The EIS and draft EM plan describe the management strategies to be implemented during the construction and operation of the mine to minimise the impact on remnant vegetation, including minimising the area to be cleared for the safe operation of the mine and a commitment to provide vegetation offsets similar to vegetation being cleared as part of the mine plan.

The EIS and EM plan has committed to a progressive rehabilitation management plan of disturbed areas to ensure the long-term viability of grazing land and native habitat. The EIS and EM plan did not provide specific environmental protection objectives for rehabilitation nor did it identify the indicators or completion criteria that will be measured to establish when rehabilitation is complete.

Noting that the department guideline, Rehabilitation requirements for mining projects guideline (Version 1), provides guidance with developing these rehabilitation criteria. It is recommended that a revised rehabilitation management plan be submitted which includes specific goals, objectives and completion criteria for all aspects of the project. The EM plan should commit that the proponent will conduct a BioCondition assessment at the end of mine life to measure the success of rehabilitation works against the relevant benchmarks.

Although the EIS subsidence management plan and Appendix Q Offset Strategy state that there would be unavoidable impacts to SSBV, the draft EM plan for the project does not contain an offset strategy. It is recommended that a biodiversity offset strategy be developed and implemented to address the objectives of both state and Commonwealth legislation and policy requirements for biodiversity offsets. This strategy should be included in a revised EM plan.

The EIS did not provide sufficient detail, including practical measures for protecting and enhancing terrestrial ecological values, including rehabilitation and restoration of habitat values and connectivity of fauna habitat.

It is recommended that prior to the conduct of the relevant activities the following are resolved:

- pre-clearing surveys be undertaken prior to construction to significantly expand the survey effort, scope and detail to avoid or mitigate the impacts of the project on flora and fauna

- develop and implement appropriate management measures to mitigate potential impacts to fauna species affected by the haul road creek crossings, including minimising vegetation clearing, having a spotter catcher present on site prior to any clearing of vegetation, installation of suitable fauna control fencing, fauna crossing signage to reduce fauna mortality
- for listed species under the EPBC Act and NC Act that are confirmed as present or likely to be present in the project area, develop species specific management plans and programs, including offsets.

Refer to section 4.14 of this report for further matters relevant to the EPBC assessment.

#### 4.13.2 Aquatic ecology

The EIS states that the project site experiences variable rainfall patterns and is characterised by highly ephemeral multi-channelled waterways. Aquatic ecology field surveys, sampling and assessment were undertaken and reported in the EIS. Aquatic habitats within the project area consist of natural streams and drainage lines, including Bullock Creek, Hat Creek, Alpha Creek, Spade Creek and farm dams. Aquatic surveys found the streams and drainage lines to be predominantly dry, with some semi-permanent waterholes, highly disturbed and devoid of aquatic vegetation. Aquatic surveys found a relatively diverse assemblage of macroinvertebrates and a low abundance and diversity of fish species. The EIS noted that the highly seasonal rainfall, flow velocity and water quality all influence the existing aquatic ecological processes and species abundance and diversity. The EIS concluded that the project has the potential to negatively impact on aquatic ecosystem communities both directly and indirectly.

The EIS noted the impacts would occur through:

- alteration to surface water flows
- loss of habitat
- limited ability of aquatic and semi-aquatic fauna to move across the site
- variable dispersive and erosive nature of the soils and the potential for sediment mobilisation
- significant alteration to surface levels from subsidence and the changes to surface changes to stream bed morphology, including changes to stream flows and exposure of soil to erosion
- ponding and surface and sub-surface cracking
- generation of poor quality stormwater from mine affected areas
- a reduction of the volume of surface water reporting downstream of the mine
- a reduction in the frequency, magnitude and duration of flow events
- construction of a haul road and upgrade of creek crossings
- vegetation clearing and disturbance.

The EIS and EM plan propose a range of mitigation measures to reduce the negative impacts to aquatic values including:

- the diversion of uncontaminated water away from active mining and infrastructure areas
- capture, diversion and storage of runoff from active mine areas
- erosion and sediment control measures to be implemented for disturbed mine areas, haul roads, creek crossings and exposed soils near or adjacent to waterways
- monitoring of runoff to observe sediment loads and the extent of sediment distribution and application of remediation measures
- vegetative stabilisation of soil for non-operational zones within the mine infrastructure area to reduce potential soil erosion.

It is recommended that the proponent develop and implement a receiving environment monitoring program (REMP) to monitor, identify and describe any adverse impacts to surface water, quality and flows and aquatic ecosystem values.



## 4.14 Cultural heritage

The EIS adequately addressed both the Indigenous cultural heritage and non-Indigenous cultural heritage matters raised in the TOR.

### 4.14.1 Indigenous cultural heritage

An approved cultural heritage management plan (CHMP) is a requirement under section 87 of the *Aboriginal Cultural Heritage Act 2003*. The EIS stated a CHMP was finalised between the proponent and the Traditional Owners, the Barada Barna Kabalbara and Yetimarla People #3 (BBKY#3) and Barada Barna Kabalbara and Yetimarla People #4 (BBKY#4). An Indigenous cultural heritage assessment, including on-site surveys of areas potentially affected by mining activities was undertaken on the project site and reported in the EIS.

The EIS stated that the landscape features that are considered to be culturally and/or archaeologically sensitive over project area are:

- creeks and watercourses and their associated banks, sandstone beds and rocky bars
- a range of vegetation within old, remnant box and brigalow forests
- rock shelters in mesas and escarpments
- large rock outcrops
- unusual landscape features.

The EIS reported that the 2007 survey recorded several hundred items, features and sites within the surveyed area including scarred trees, several natural landscape features, single artefacts and scattered artefacts including stone tools.

The EIS stated that there would be significant impacts on Indigenous cultural heritage from construction activities, including the development of the site infrastructure areas (MIA and MWD) with less potential impact in areas subject to subsidence.

The EIS stated that the Traditional Owners recognise the balance to be achieved in protecting cultural heritage and development of the project and have identified the following Indigenous cultural heritage management measures in the CHMP:

- In accordance with provisions of the ACH Act, the proponent will exercise a duty of care to ensure that measures are implemented for the protection of identified Indigenous cultural heritage, and cultural heritage artefacts/items detected during ground disturbance.
- A committee of Traditional Owner representatives and representatives of the proponent has been formed to assist with the management of cultural heritage issues. This committee will ensure that information is circulated to the various stakeholder groups; will decide on the most appropriate strategies for managing impacts to identified cultural heritage sites and locations; and manage artefacts/items discovered in the process of mining.
- A procedure for on-going Indigenous cultural heritage surveys has been developed and documented. This procedure is designed to allow for the monitoring, auditing and management of the survey work undertaken and governs:
  - notice of surveys before commencement of project activities
  - performance of surveys
  - assessment of survey results
  - salvages
  - management of areas outside direct impact.
- Where it has been recognised that there is a significant potential for the presence of subsurface Indigenous cultural heritage in an area that is planned to be subject to significant ground disturbance caused by project activities, cultural heritage monitors will be engaged during the stripping of surface materials.

- Sites of Indigenous cultural heritage located during a cultural heritage survey will be assessed in accordance with a trigger/action/response plan matrix which is appended to the CHMP. This matrix is designed to provide a quantitative method for the assessment and handling of cultural heritage finds.
- A procedure to apply in the event that any project personnel locate items of Indigenous cultural heritage that were not salvaged or identified by the Traditional Owners, including guidance on how to deal with skeletal material if discovered.
- All personnel employed on the project are required to undergo training in relation to cultural heritage and be aware of the significance of cultural heritage finds to the Traditional Owners.
- A conflict resolution process.

#### 4.14.2 Non-Indigenous cultural heritage

A non-Indigenous cultural heritage assessment was undertaken of the project area. On that basis, the EIS concluded that the project area is located on a portion of the original pastoral run described as Mountain Station on historical maps from the 1880s. The EIS report four places of historical interest on the project site including a series of yards, windmills, dams, water tanks and a blazed survey tree. The EIS concluded that these places are not considered to contain enough heritage value to warrant further assessment or specific mitigation strategies, but do however provide a good indicator to potential heritage values within the region.

The EIS concluded that no sites of non-Indigenous cultural heritage significance had been identified on site.

### 4.15 Matters of national environmental significance

On 16 August 2007, the project was referred to the former Commonwealth Department of Environment and Water Resources (DEWR) (now the Department of Sustainability, Environment, Water, Population and Communities (SEWPAC)). On 14 September 2007, DEWR decided that the project was a controlled action pursuant to section 75 of the EPBC Act. The controlling provisions were section 18 and 18A (Listed threatened species and communities) as the project was likely to have significant impacts on listed threatened species and communities. Consequently, the project will require approval under Part 9 of the EPBC Act. An assessment of the potential impacts on matters of national environmental significance (MNES) was included in the EIS.

On the basis of fieldwork to assess the fauna species and vegetation communities of conservation significance present on-site and database searches, the EIS noted that a number of EPBC Act listed threatened flora and fauna species were either found on-site or have the potential to occur on-site.

The EIS confirmed that the project has the potential to impact matters of national environmental significance as the project area contains:

- an endangered ecological community listed under the EPBC Act, namely brigalow (*Acacia harpophylla*)—dominant and co-dominant communities (RE 11.4.7—Open forest to woodland of *Eucalyptus populnea* with *Acacia harpophylla* and/or *Casuarina cristata* on Cainozoic clay plains; and RE 11.4.9—*Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains) Threatened Ecological Community (TEC)—known to occur within the project site
- species listed under the EPBC Act as vulnerable:
  - squatter pigeon (southern) (*Geophaps scripta scripta*)—known to occur within project site
  - the shrub *Xerothamnella parvifolia*—known to occur within the project site.

The project has the potential to impact matters of national environmental significance (MNES) as the project area has the potential to contain:

- species listed under the EPBC Act as vulnerable:
  - yakka skink (*Egernia rugosa*)—potential to occur within project site
  - brigalow scaly-foot (*Paradelma orientalis*)—potential to occur within the project site
  - south-eastern (Corben's) long-eared bat (*Nyctophilus corbeni*)—potential to occur within project site.

The EIS included a MNES impact assessment report that assessed the potential impacts to MNES by the project. That assessment was reportedly made under the Significant Impact Guidelines (SEWPAC 2009) for the following species:

- brigalow (*Acacia harpophylla*)—dominant and co-dominant communities (TEC)
- *Xerothamnella parvifolia*
- squatter pigeon (southern) (*Geophaps scripta scripta*)
- brigalow scaly-foot (*Paradelma orientalis*)
- yakka skink (*Egernia rugosa*).

The assessment concluded that the project is not expected to cause a significant impact to any listed matter.

The EIS stated that approximately 4.76 ha of brigalow (*Acacia harpophylla* dominant and co-dominant) endangered threatened ecological community (TEC) is expected to be affected by surface disturbance or subsidence related impacts. The EIS concluded that the loss would be negligible as the brigalow TEC on the site comprises small disjunct areas which have been significantly disturbed with degraded habitat values resulting from historical grazing pressures.

The EIS identified *Xerothamnella pavifolia* as occurring on laterite hills located in the north of the project site. This species is listed as Vulnerable under the EPBC Act. The EIS concluded that the species is not expected to be impacted by the project as the proposed vegetation clearing will avoid areas considered likely to support *Xerothamnella pavifolia*.

The EIS identified that the squatter pigeon (southern) (*Geophaps scripta scripta*) had been recorded on the project site. This species is listed as 'vulnerable' under the EPBC Act. Suitable habitat for this species was identified as widespread throughout the project site. The EIS did not state the actual area of habitat for this species that was present on the project site nor state the area likely to be impacted by the project. There was no statement about the regional significance of the habitat on the site. The EIS concluded that, as the habitat disturbance was limited and that suitable habitat is abundant across the site and the local area, the impacts of the project on this species would be negligible.

The EIS stated that the brigalow scaly-foot (*Paradelma orientalis*) may occur on the project site. The species is listed as 'vulnerable' under the EPBC Act. The EIS stated that site does support sclerophyllous woodland communities with the requisite habitat features critical to the survival of the species. The EIS did not specify the area of requisite habitat known to occur on the site. The EIS stated that historic disturbance and a predominance of the introduced buffel grass (*Pennisetum ciliare*) may also reduce the possibility of the existence of the species on the site and it therefore without stating the habitat area likely to be impacted concluded that the species habitat potentially impacted by the project would be negligible.

The EIS stated that the yakka skink (*Egernia rugosa*) was not found in fauna surveys on the site, however its requisite habitat was identified as present. The species is listed as 'vulnerable' under the EPBC Act. The EIS did not specify the area of requisite habitat known to occur on the site, nor the area of habitat likely to be impacted by the project. The EIS stated that the species is relatively common and widespread across the regional landscape, though this was not supported by quantitative data. The EIS concluded that the project would not likely have a significant impact on any population of this species, its habitat or breeding and feeding resources.

The EIS concluded that through effective design and mitigation any impacts on MNES would be minimised to a degree not considered to be significant and did not therefore propose to provide an offset under the EPBC Act.

SEWPAC has reviewed the EIS and has advised the department that it:

- does not accept the conclusion of the EIS that the project is unlikely to have a significant impact on MNES, nor that no environmental offset is required
- considers that the offsets proposed are not adequate to mitigate the potential impacts of the project on MNES and that confirmation of additional offsets or mitigation actions is required before consideration would be given to approving the project under the EPBC Act
- will consequently request specific additional information on impacts to MNES, offsets and appropriate management measures to mitigate identified potential impacts.

## 4.16 Social issues

The EIS provided an adequate social impact assessment (SIA) for the project. The project would be located in a rural area within the Isaac Regional Council area, the closest towns are Moranbah and Coppabella. Historically the surrounding area has been used for cattle grazing. Current neighbouring land uses involve cattle grazing and coal mining. The EIS stated that construction and mine development activities are expected to commence in late 2013 and 2015. Longwall production and coal process would commence in 2017 and continue for a period of approximately 20 years. The mine workforce would number approximately 350 persons.

The EIS assessed the potential impacts on the lifestyle, wealth, safety, health and wellbeing of the community surrounding the project. Baseline data in the EIS was sourced from desktop studies, statistical and demographic reports, from the Australian Bureau of Statistics (ABS) and other sources, and project's community and stakeholder engagement program.

The negative social impacts identified in the EIS included, housing demand and supply, community infrastructure and services and social implications and workforce housing and accommodation arrangements. Based on further assessment by the proponent and submissions including from the Isaac Regional Council, the accommodation strategy was reviewed and proposed in the EIS to utilise QRI Coppabella and MAC Coppabella camp style accommodation for the majority (350 or approximately 90 per cent) of its construction and operational employees. The remainder would likely be accommodated in Moranbah in proponent-owned and managed accommodation. The EIS stated that there is enough single person quarters available locally to accommodate the majority of the project's workforce and they would be transported between the camp or housing development and the mine site by bus.

Whilst the EIS generally addressed the social impact matters raised in the TOR, a social impact management plan (SIMP) is required for the project by the Department of State Development Infrastructure and Planning (DSDIP) under the Queensland Government's Sustainable Resource Communities Policy 2008. The SIMP will provide the framework for ongoing management of social impacts during the operation and decommissioning stages of the project.

The EIS committed to the preparation of a social management plan based on Central Queensland Strategy for Sustainability—2004 and Beyond Version 2 (CQSS2) for review to DSDIP. The EIS stated that the SMP would examine issues identified in the SIA including:

- housing and accommodation issues
- cumulative impacts
- training
- education and child care
- traffic and road safety
- health care and emergency service.

The EIS stated that the objective would be to develop a plan that helps strengthen the region's facilities and services in a sustainable manner. It is recommend that the proponent commits to the ongoing provision of information to the community about environmental monitoring and mitigation measures for any noise, dust and vibration impacts from the project.

## 4.17 Economy

The EIS adequately addressed the economic impact matters raised in the TOR.

Traditionally the economic base of the region is supported by agricultural activities such as cereal crops, sugar and beef production. More recently the region has seen the development of aquaculture, fruit and vegetable growing and coal mining.

The EIS stated that the projected capital expenditure of the project is \$640 million over a 28-month period, and an annual operating budget (once full production is achieved) of around \$250 million.

The current land use at the project site is low intensity cattle grazing. The EIS stated that the resultant post-mining land use for the mine site would be predominantly low intensity grazing. The EIS stated that there is not expected to be any impact on the viability of agricultural land use following decommissioning and rehabilitation of the mine site. The EIS estimated that the capacity of grazing land would be the same as pre-mining land use. The EIS stated that 1542 ha within the project are a agricultural class 2 land, which is suitable for low intensity grazing. The EIS did not estimate approximate cost per year (over the life of the mine) for the vegetation re-establishment program. The EIS stated that approximately 204.2 ha of mine disturbed land would be required to be rehabilitated. This land is currently used for grazing beef. The EIS assumed that while the underground operations will result in surface subsidence, it will not impact on the current productive status of the land. The EIS estimated that the loss of foraging the disturbed land would be a loss of sales of approximately 22 cattle per year, or a loss of regional production of \$22,000 per year of beef cattle sales.

The EIS stated that the 271 ha of estimated land disturbance did not include any unique environmental features and its disturbance will not lessen the ability of the environment, at a local, regional or state level to provide ecosystem services such as waste disposal and assimilation, flood mitigation, water catchment or pollination of crops. The EIS concluded no value would be assigned for the loss of ecosystem services as a result of the project and this would be offset by the employment opportunities and income (wages and salaries) and the wealth (approximately \$60 million per year) created.

The EIS assessed the value of impacts on the local regional and state economy using input-output (I-O) analysis and assessed that there would be a positive economic impact to the local, regional, State and national economies.

At a local level the town of Moranbah would be most affected by the project's development operations. The EIS reported that the Isaac Regional Council area would receive a direct increase in the demand for employees, housing, local services and supplies, whilst noting that most employees will:

- commute from the regional centre of Mackay to the local area (drive-in drive-out)
- reside in temporary accommodation for the duration of their shifts
- have little or no interaction with the local community
- have minimal spending in the local community.

The value of the coal resource to be mined is subject to the exchange rate and coal price fluctuations. The EIS did not state the estimated royalty payment per year to the State but estimated that the project would employ 160 contractors during the construction period of the project with an estimated average operational workforce of 271 permanent employees (peaking at approximately 350) employed of the life of the mine. The EIS did not estimate the total employment related contribution to the local and regional economy per year over the 20 years of operation of the project.

The EIS concluded that the negative impacts would be offset by the positive economic impacts of the project and that there would be a net positive economic impact to the local, regional, state and national economies.

## 4.18 Health and safety

The Health and Safety section of the EIS adequately addressed the matters raised in the TOR, noting that the potential impacts on the workforce are covered by other relevant legislation and are not the subject of approvals under the EP Act.

The EIS developed and committed to implement a safety management system (SMS) for the project. The SMS should ensure the all activities that have the potential to impact on occupational health and safety on the mine site are carried out in accordance with all relevant legislation and Australian standards.

## 4.19 Hazard and risk

The EIS conducted a preliminary hazard and risk assessment of the potential hazard and risks to people and property associated with the project. The EIS presented an acceptable risk management framework and risk assessment methodology and criteria for the project.

The EIS outlined suitable control strategies to mitigate and manage all of the project's identified potential hazards and risks to acceptable levels.

The EIS summarised the risk and hazard sources and outlined management measures. The EIS includes a commitment to:

- dust monitoring and management and the EM plan for air quality presents the scale of monitoring and mitigation practices that would be required for the management of dust
- the environmental values that are to be protected in relation to noise impacts, the potential impacts and the mitigation measures proposed to maintain noise levels within acceptable limits. The SMS would be implemented to ensure that construction or operations personnel are not adversely impacted by noise levels
- implement the SMS at the commencement of the project to provide guidance in spill prevention and response
- implement a weed and pest management plan to address the occurrence of Class 2 weeds on the mine site
- implement speed control (signage), demarcation, driving to conditions and prescribed driving etiquette within the construction and mine operations area to control the risk of vehicle accidents
- develop and implement standard operating procedures for the storage, containment, disposal and spill response for fuels and oils and flammable and combustible liquids in accordance with the SMS. The storage of bulk liquids (e.g. diesel fuel) and smaller quantity chemicals would be in accordance with AS1940-2004
- manage all explosives in accordance with the operational procedures for the transportation, storage and handling of explosives on site and in accordance with:
  - *The Explosives Act 1999*
  - AS 2187.1-1998/Amdt 1-2000: Explosives—Storage, transport and use
  - AS 2187.2-2006: Explosives—Storage and use—Use of explosives
- implement control measures to control spontaneous combustion in underground workings and coal stockpiles
- develop and implement an emergency response plan for mine emergency situations consistent with local and regional emergency plans, including the requirement for all staff to complete fire safety induction training
- ensuring that public liability insurance arrangements are in place for the operators of the project.

The EIS did not provide sufficient information on the appropriate storage, including volume of diesel fuel to be stored on the project site.

It is recommended that the hazards associated with the project are re-evaluated prior to the commencement of the construction and operational phases of the project when the mine's detailed design and operational plans are finalised.

The EIS satisfactorily addressed the matters related to hazard and risk raised in the TOR.

## 4.20 Rehabilitation

The EIS reported that all areas of land that will be disturbed by mining activities would be rehabilitated to create a stable landform with the aim of establishing a self-sustaining vegetation cover of native trees, shrubs and grasses (hectare area not defined in the EIS), including specific areas suitable for cattle grazing as the post mining land use (hectare area not defined in the EIS). The EIS reported that areas located above the underground mining activities would be rehabilitated to repair surface cracks and stabilise impacted creek banks and beds. The EIS concluded that the expected subsidence would not result in the isolation of the subsided areas from cattle grazing and as such would not have a significant impact on land use environmental values. The EIS reported the pre- and post-mining land contours and that the subsidence process would produce a final landform (after rehabilitation) similar to the immediate surroundings (given a maximum predicted subsidence of < 3 m over a distance of 205–340 m), which would include gentle slopes and generally free draining topography. The EIS concluded that there would not be post mine landform features or land that would not be suitable for low intensity cattle grazing. The EIS stated that in order to sustain the desired cattle grazing land use without degradation, post mining land use would only be used in accordance with the limits of the agricultural suitability class. However, the EIS did not identify or detail where

grazing would not be possible on disturbed mine areas where limited soil-water availability, low vegetation cover and/or poor rehabilitation success occurs.

A finalised rehabilitation management plan was not provided as part of the EIS. Relevant commitments provided in the EIS included:

- topsoil management including, preferential stripping and stockpiling
- erosion and sediment control including appropriate management of dispersive soils
- best practice revegetation techniques
- selecting and sourcing suitable seed and tree tube stock mixes to achieve the nominated post mine land use
- fertilizer management including the use of legume species to supply bio-available nitrogen to the soil
- drainage management on slopes to manage erosion processes from storm runoff
- revegetation of MIA, RWD, MWD, haul roads and creek crossings and areas subject to subsidence
- regular monitoring, surveys and reporting of all disturbed areas including, rehabilitated and subsided areas.

A finalised rehabilitation management plan (RMP) is required to ensure that the intent set out in the EIS is achieved. The RMP should address at least the following:

- landform design and acceptance criteria for all end of mine landforms
- detailed progressive rehabilitation methods for all disturbed areas
- water management criteria
- leading practice rehabilitation performance criteria
- revegetation criteria
- rehabilitation monitoring and success criteria
- weed and pest management
- a process to progressively report the rehabilitation management actions undertaken, the outcome of those actions and the mechanisms to be used to identify the need for improved management
- a description of the potential risks to successful management and rehabilitation on site and a description of the contingency measures that would be implemented to mitigate these risks
- details of the parties responsible for reviewing and implementing the RMP.

The RMP should address the rehabilitation of all mine affected areas.

The rehabilitation process should be developed in conjunction with a mine closure management plan. The mine closure management plan should address the decommissioning and rehabilitation of all disturbed areas and subsided land.

The above commitments to manage and rehabilitate mine affected areas are considered adequate for the project however the draft EM Plan does not include specific goals, objectives and completion criteria for all aspects of the proposal.

Consequently, recommended conditions relating to rehabilitation have not been provided in Appendix 1, and should be resolved with the department and included in a revised EM plan, prior to decisions being made whether to approve the granting of an EA.

It is noted that the EIS includes a commitment to provide a RMP and rehabilitation monitoring program to the department prior to commencement of construction activities.

## 5 Adequacy of the environmental management plan

The EM plan developed through this EIS process has included input from the department, other state government departments, the commonwealth, local organisations, industry and the public. Throughout the EIS process, the proponent was advised of a range of deficiencies in the EM plan, those matters have been progressively improved to the extent required for the EIS process, however many are now noted as outstanding commitments to be delivered after this EIS process is completed.

The draft EM plan as submitted with the EIS should be revised according to the recommendations included in this report. Where possible draft conditions have been presented in Appendix 1 of this report, this has been limited to situations where the EIS provided sufficient information. A revised EM plan would be required prior to the department considering the granting of an EA and formulation of the full set of associated draft EA conditions. Guidance on the content of an EM plan is available at section 203 of the EP Act and in departmental guidelines.

## 6 Recommendations about the suitability of the project

The EIS process has compiled information about the proposed project, the values of the site and the potential impacts to those values. A range of mitigation and management measures including environmental protection commitments were proposed in the EIS and are summarised in this assessment report. Importantly, one of the principal tools to implement those mitigation measures and environmental commitments is the EM plan. The EM plan sets out how each matter is to be managed to deliver the acceptable environmental outcome.

This report recommends that the following outstanding matters be addressed prior to the project proceeding:

- development of a revised mine plan to ensure that subsidence will be completely confined to the lease area, commitment to be made in revised EM plan
- development and approval of a construction management plan prior to the project commencing, commitment to be made in revised EM plan
- development and submission of a water management plan, commitment to be made in revised EM plan
- development and submission of an irrigation management plan for RO permeate and treated effluent from the STP including modelling, commitment to be made in revised EM plan
- development and submission of a groundwater management plan, commitment made in revised EM plan
- development and submission of rehabilitation management plan and rehabilitation monitoring program prior to the commencement of the project, commitment to be made in revised EM plan
- development of agreed rehabilitation monitoring and success criteria for land suitability, land use, landform stability and land contamination, commitment to be made in revised EM plan
- development and submission of a BioCondition assessment at the end of mine of mine life, commitment to be made in revised EM plan
- development and submission of a mine closure plan, commitment to be made in revised EM plan
- development and submission of a decommissioning and post-closure management plan, commitment made in revised EM plan
- development and submission of a weed and pest management plan, commitment to be made in revised EM plan
- development and submission of a waste management plan, commitment to be made in revised EM plan



- development and submission of a social impact management plan, commitment to be made in revised EM plan
- development and submission of an environmental offset plan, likely to be required prior to any Commonwealth approval
- development and submission of specific species and ecological communities management plans for species under the EPBC Act, to be provided prior to any interference with the relevant species or communities
- development and submission of specific species management plans for listed species under the NC Act, to be provided prior to any interference with the relevant species
- development and submission of specific management programs, including an environmental offset, to be provided prior to any interference with the relevant species or communities
- development and submission of a (water quality) receiving environment monitoring program, commitment to be made in revised EM plan
- development and submission of a health and safety management plan, commitment to be made in revised EM plan
- development and submission of an emergency management plan, commitment to be made in revised EM plan
- consult with the Traditional Owners prior to any clearing or construction works being undertaken for the MIA, MWD, RWD and haul road and creek crossings, commitment to be made in revised EM plan
- re-evaluate of the hazards and risks to people and property associated with the project immediately prior to commencement, commitment to be made in revised EM plan.

## 7 Recommendations for conditions for any approval

### 7.1 *Environmental Protection Act 1994*

Throughout this EIS process, including development of the draft EM plan, a range of environmental impacts and relevant mitigation measures have been identified. Where the EIS has shown that such impacts are likely (and where legislation, policy or guidelines dictate) some activities associated with the project will need to be constrained to achieve acceptable environmental outcomes.

For that purpose and as required under section 59 of the EP Act, this report includes at Appendix 1 a set of recommended conditions for approval. The conditions are not considered complete nor finalised and are provided for consideration in developing draft EA conditions for the project under the EP Act. At that time the administering authority will decide, under section 210 of the EP Act, what conditions are necessary or desirable.

### 7.2 Approvals under other legislation

#### 7.2.1 *Water Act 2000 and Sustainable Planning Act 2009*

As outlined in section 4.2 of this report and discussed within other sections of this report, a number of separate water licences and associated development approvals under the *Water Act 2000* and *Sustainable Planning Act 2009* respectively would be required for the project. These approvals relate to the construction of the diversion drains in the upper reaches of the project's catchments to direct clean water around the site and away from mining areas, water bore drilling and licence requirements, creek crossings, as well as the take of surface water resources.

However, the EIS has provided insufficient detail about the engineering designs, rehabilitation and monitoring for diversion drains and groundwater bores, for this EIS assessment report to be able to include recommended conditions for those water licences and development approvals. Conditions for these activities will be decided when

the proponent has lodged water licence and development approval applications with DNRM subsequent to this EIS process being completed.

### 7.2.2 *Nature Conservation Act 1992*

A clearing application must be made for plants that are listed as 'endangered', 'vulnerable' or 'near threatened', unless otherwise authorised under the protected plant exemption under section 41(1)(a)(ii) of the Nature Conservation (Protected Plants) Conservation Plan 2000.

Any offsets proposal, including any species management plans should be developed generally in accordance with the Queensland Government's Environmental Offset Policy 2008 and offset requirements under the EPBC Act for loss of ecological values.

## 8 Suitability of the project

The department has considered the submitted EIS, all submissions and the standard criteria. The project is assessed here as being suitable, provided the EM plan is refined and completed in the manner directed in this report and the subsequent environmental authority, if granted, being conditioned suitably to implement the specific environmental protection commitments set out in the EIS and summarised in this EIS assessment report. Consequently, the project is considered suitable to proceed to the next stage of the approval process, noting that the recommendations of this EIS assessment report should be fully implemented.

## Approved by

Lindsay Delzoppo

Signature

Lindsay Delzoppo

Director, Statewide Environmental Assessments

Department of Environment and Heritage Protection

4 December 2012

Date

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**Schedule A: General**

**Scope of activity**

- A1** This environmental authority authorises a coal extraction rate of up to three (3) million tonnes per annum (Mtpa) of run-of-mine ore.

**Financial assurance**

- A2** Provide financial assurance in the amount and form required by the administering authority prior to the commencement of activities proposed under this environmental authority.  
Note: The calculation of financial assurance for condition A2 must be in accordance with the administering authority's Guideline—Financial Assurance for Mining Activities, and may include a performance discount. The amount is defined as the maximum total rehabilitation cost for complete rehabilitation of all disturbed areas, which may vary on an annual basis due to progressive rehabilitation. The amount required for the financial assurance must be the highest total rehabilitation cost calculated for any year of the plan of operations and calculated using the formula: (financial assurance = highest total annual rehabilitation cost x percentage required).

- A3** The financial assurance is to remain in force until the administering authority is satisfied that no claim on the assurance is likely.  
Note: Where progressive rehabilitation is completed and acceptable to the administering authority, progressive reductions to the amount of financial assurance will be applicable where rehabilitation has been completed in accordance with the acceptance criteria defined within this environmental authority.

**Prevent and/or minimise likelihood of environmental harm**

- A4** In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and/or to minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.

**Maintenance of measures, plant and equipment**

- A5** The environmental authority holder must ensure:
- a) that all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority are installed
  - b) that such measures, plant and equipment are maintained in a proper condition
  - c) that such measures, plant and equipment are operated in a proper manner.

**Monitoring and records**

- A6** Record, compile and keep, for a minimum of five years, all monitoring results required by this environmental authority and make available for inspection all or any of these records upon request by the administering authority.
- A7** Where monitoring is a requirement of this environmental authority, ensure that a competent person(s) conducts all monitoring.

**Storage and handling of flammable and combustible liquids**

- A8** Spillage of all flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm (other than trivial harm) and maintained in accordance with the current version of Australian Standard (AS) 1940—Storage and Handling of Flammable and Combustible Liquids.
- A9** Spillage of all chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.

**Notification of emergencies, incidents and exceptions**

- A10** As soon as practicable after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority, the administering authority must be notified of the release by telephone, facsimile or email.
- A11** The notification of emergencies or incidents as required by condition A10 must include, but not be limited to:
- a) the holder of the environmental authority
  - b) the location of the emergency or incident
  - c) the number of the environmental authority
  - d) the name and telephone number of the designated contact person
  - e) the time of the release
  - f) the time the holder of the environmental authority became aware of the release
  - g) the suspected cause of the release
  - h) the environmental harm caused, threatened, or suspected to be caused by the release
  - i) actions taken to prevent any further release and mitigate any environmental harm caused by the release.
- A12** Not more than 14 days following the initial notification of an emergency or incident, written advice must be provided of the information supplied in accordance with condition A10 in relation to:
- a) proposed actions to prevent a recurrence of the emergency or incident, and
  - b) outcomes of actions taken at the time to prevent or minimise environmental harm.

- A13** As soon as practicable, but not more than six weeks following the conduct of any environmental monitoring performed in relation to the emergency or incident, which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this environmental authority, written advice must be provided of the results of any such monitoring performed to the administering authority.

**Definitions**

- A14** Words and phrases used throughout this environmental authority are defined in the Definitions section of this authority. Where a definition for a term used in this environmental authority is sought and the term is not defined within this environmental authority, the definitions in the *Environmental Protection Act 1994*, its regulations and policies must be used.

**Schedule B: Air**

**Dust nuisance**

- B1** The release of dust and/or particulate matter resulting from the mining activity must not cause an environmental nuisance at any nuisance sensitive or commercial place.
- B2** The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.
- B3** Dust and particulate matter must not exceed any of the following levels when measured at any nuisance sensitive or commercial place:
- a) dust deposition of 120 milligrams per square metre per day over a 30-days averaging period, when monitored in accordance with AS 3580.10.1 of 2003 (or more recent editions), or
  - b) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre ( $\mu\text{m}$ ) ( $\text{PM}_{10}$ ) suspended in the atmosphere of 50 micrograms per cubic metre with not more than five days of exceedances allowed in any one year period. The five days of exceedances per year are based on the natural events such as bushfires and dust storms.
- When monitored in accordance with:
- AS 3580.9.6 of 2003 (or more recent editions) Ambient air—Particulate matter—Determination of suspended particulate  $\text{PM}_{10}$  high-volume sampler with size-selective inlet—Gravimetric method, or
  - any alternative method of monitoring  $\text{PM}_{10}$  which may be permitted by the Air Quality Sampling Manual as published from time to time by the administering authority.
- B4** When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and the results notified within 14 days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected nuisance sensitive place and at upwind control sites and must include:
- a) for a complaint alleging dust nuisance, dust deposition
  - b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 ( $\mu\text{m}$ ) ( $\text{PM}_{10}$ ) suspended in the atmosphere over a 24 hour averaging time.
- B5** If monitoring conducted as a result of a complaint indicates an exceedance of the guidelines detailed in condition B3, the holder must:
- a) address the complaint through the use of appropriate dispute resolution if required
  - b) immediately implement dust abatement measures.

**Power plant and flare contaminants release to the atmosphere**

- B6** The release of contaminants to the atmosphere from a point source must only occur from those release points identified in Table 1: Contaminants release limits to air and must be directed vertically upwards without any impedence or hindrance.
  
- B7** Contaminants must be released to the atmosphere from a release point at a height and a flow rate not less than the corresponding height and velocity stated for that release point in Table 1: Contaminants release limits to air.
  
- B8** Contaminants must not be released to the atmosphere from a release point at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in Table 1: Contaminants release limits to air and monitored not less frequently than Table 2: Required release point determinations.

**Table 1: Contaminants release limits to air**

Release point number	Minimum release height (metres)	Minimum velocity (m/sec)	Contaminant release	Maximum release limit <sup>1</sup>
A1 to A15—power generator stacks (maximum number of units = 15, total power generating capacity = 18.5 MW)	7	30	Oxides of nitrogen	0.7 grams/second/unit
A1 to A15—power generator stacks (maximum number of units = 15, total power generating capacity = 18.5 MW)	7	30	Carbon mono-oxide	0.2 grams/second/unit
A16 to A17—flare stacks	6	12	Oxides of nitrogen	0.7 grams/second/unit
A16 to A17—flare stacks	6	12	Carbon mono-oxide	0.25 grams/second/unit

Note: The above oxides of nitrogen (NOx) and carbon mono-oxide (CO) release limits are applicable during all timings except start-up and shut-down. The start-up duration is allowed up to 30 minutes.

**B9** The only type of fuel to be burnt in power generation under normal operating conditions is coal seam methane gas and diesel oil.

**Monitoring of contaminant releases to the atmosphere**

**B10** The holder of this approval must conduct and keep records of a monitoring program of contaminant releases to the atmosphere at the release points, frequency, and for the parameter specified in Table 2: Required release point determinations and which complies with the following:

- a) monitoring provision for the release points listed in Table 2: Required release point determinations must comply with AS 4323.1—1995 Stationary source emissions Method 1: Selection of sampling provisions.
- b) The following tests must be performed for each required determination specified in Table 2 Required release point determinations:
  - (i) gas velocity and volume flow rate
  - (ii) temperature and oxygen content
  - (iii) water vapour concentration
- c) where practicable, samples taken must be representative of the contaminants discharged when emissions are expected to be at maximum rates
- d) during the sampling period the following additional information must be gathered:
  - (i) electricity generation rate at the time of sampling
  - (ii) fuel type and consumption rate
  - (iii) number of generating units in use
  - (iv) reference to the actual test methods and accuracies.

**Table 2: Required release point determinations**

Determination required	Release point numbers	Frequency
Mass emission rate and concentration NO <sub>x</sub> and CO in the flue gas at five per cent oxygen reference level.	Generator stacks A1 to A15 inclusive	All stacks must be monitored during commissioning (see Note 1) of the units and three stacks per year thereafter on rotational basis (all units must be samples over a period of five years).
Mass emission rate of NO <sub>x</sub> and CO	Flare stacks A16 and A17	Flare emissions can not monitor. Thus, these will be estimated using the manufacture specifications



Note: Within three months of commissioning the power generation units, the holder of this authority must conduct air emission monitoring to demonstrate compliance with air emission limits listed in Table 1: Contaminants release limits to air.

- B11** All release points referred to in Table 1: Contaminant release limits to air must be conspicuously marked with the corresponding release point number.

### **Flare conditions**

- B12** The flare must be equipped with a flare tip design to provide good mixing with air, flame stability and achieve a minimum volatile organic compound (VOC) removal efficiency of 98 per cent under varied gas flow rate and meteorological conditions and meet the best practice design standards.
- B13** The flare must be equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition and provides immediate notification of appropriate personnel when the ignition system ceases to function.
- B14** The flare must be designed to handle large fluctuations in both the volume and the chemical content of gases.
- B15** Visible emissions must not be permitted for more than five minutes in any two-hour period.
- B16** A continuous vent gas flow device must be installed and be operated to monitor the volume flow rate of the gases sent to the flare.

### **General dust control**

- B17** The holder must design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the site including wind blown and traffic generated dust.
- B18** The holder must design, construct, operate and maintain the project in a manner that minimises the potential generation of fugitive dust emission from plant and equipment, including where relevant and practicable, design of the project to minimise the number of coal transfer points, minimise the drop height from stackers to stockpiles, full or partial enclosure of conveyors and installation of wind shields and belt cleaning systems to conveyors.
- B19** For the purpose of avoiding any release of dust or particulate matter from the approved place which could cause an environmental nuisance, the following measures must be taken:
- a) Stockpiles must be maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere.

Reasonable and practicable measures may include, but are not limited to, anemometer switching systems which trigger operation of effective water spray systems during winds likely to generate such releases; use of approved dust suppressants; shielding and storage in bunkers.

- b) Trafficable areas must be maintained using all reasonable and practicable measures to minimise the release of windblown dust or traffic generated dust to the atmosphere. Reasonable and practicable measures may include, but are not limited to, sealing with bitumen or other suitable material; keeping surfaces clean; use of water sprays; adoption and adherence to speed limits (e.g. less than 40 kilometres per hour for unsealed road); use of approved dust suppressants; and wind breaks.
- c) Raw material preparation plants and external transfer conveyors must be operated and maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere. Reasonable and practicable measures may include, but are not limited to, transfer of materials in a moist state; enclosure or sealing of conveyors; use of water sprays at transfer points; shielding; and wind breaks.
- d) Water sprays must be installed at all major dust emission sources.

**Schedule C: Water**

**Overflow of mine-affected water from regulated structures**

- C71** The overflow of mine affected water from one or more of the dams listed in Table 26: Location of Regulated Structures to receiving waters is authorised if:
- a) the holder has complied with **ALL** conditions listed in Schedule G—Regulated structures of this environmental authority
  - b) the overflow is a direct result of rainfall events which since 1 November have generated a total rainfall depth in excess of that determined under the design storage allowance (DSA) annual exceedance probability (AEP) event listed in Table 26: Location of Regulated Structures for the relevant dam (or network of linked containment systems)
  - c) the holder has taken all reasonable and practicable measures to prevent an overflow from the relevant dam.
- C72** Any release of mine affected water resulting from an overflow from one or more of the dams listed in Table 26: Location of regulated structures and Table 17: Overflow release to the receiving environment to receiving waters must be monitored at the locations specified in Table 17: Overflow release to the receiving environment and Table 18: Monitoring locations for overflow releases for those quality characteristics and at the frequencies specified in Table 19: Release contaminant trigger investigation levels—overflow releases.

**Table 17: Overflow release to the receiving environment**

Release point (RP)	Northing (GDA94)	Easting (GDA94)	Contaminant source and location	Monitoring point	Receiving waters description
*	*	*	*	*	*
*	*	*	*	*	*
*	*	*	*	*	*
*	*	*	*	*	*

\*To be negotiated between the proponent and the department during the EA development stage

**Table 18: Monitoring locations for overflow releases**

Monitoring Point	Northing (GDA94)	Easting (GDA94)
<b>Upstream</b>		
*	*	*
<b>Downstream</b>		
*	*	*

\*To be negotiated between the proponent and the department during the EA development stage

Table 19: Release Contaminant Trigger Investigation Levels – Overflow Releases

Quality characteristic	Trigger level	Monitoring frequency
Electrical conductivity ( $\mu\text{S}/\text{cm}$ )	*	*
pH (pH Unit)	*	
Turbidity	*	
Suspended Solids (mg/L)	*	*
Sulphate ( $\text{SO}_4^{2-}$ ) (mg/L)	*	
Aluminium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Arsenic ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Cadmium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Chromium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Copper ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Iron ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Lead ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Mercury ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Nickel ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Zinc ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Boron ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Cobalt ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Manganese ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Molybdenum ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Selenium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Silver ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Uranium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Vanadium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Ammonia ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Nitrate ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Petroleum hydrocarbons (C6-C9) ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Petroleum hydrocarbons (C10-C36) ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	
Fluoride ( $\mu\text{g}/\text{L}$ ) <sup>2</sup>	*	
Sodium ( $\mu\text{g}/\text{L}$ ) <sup>1</sup>	*	

<sup>1</sup> All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered).

Trigger levels for metal/metalloids apply if dissolved results exceed trigger.

<sup>2</sup> Fluoride must be measured as total (unfiltered).

\* To be negotiated between the proponent and the department during the EA development process.

**C73** If quality characteristics of the release exceed any of the trigger levels specified in Table 19: Release contaminant trigger investigation levels—overflow releases during an overflow release, the holder must compare the downstream results in the receiving waters to the trigger values specified in Table 19: Release contaminant trigger investigation levels—overflow releases and:

- a) where the trigger values are not exceeded at downstream locations, then no action is to be taken, or
- b) where the downstream results exceed the trigger values specified in Table 19: Release contaminant trigger investigation levels—overflow releases for any quality characteristics, compare the results of the downstream site to the data from background monitoring sites and from the release point, and:
  - i. if the result is less than the background monitoring site data, then no action is to be taken, or
  - ii. if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority within 28 days of the cessation of the release, outlining:
    - details of the investigations carried out
    - actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C73 b) ii of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

**C74** The holder must notify the administering authority as soon as practicable and no later than 24 hours after the commencement of an overflow release of mine affected water to the receiving environment in accordance with conditions C71 and C72 of this environmental authority. Notification must include the submission of written advice to the administering authority of the following information:

- a) release commencement date/time;
- b) release points;
- c) receiving water/s; and
- d) any details (including available data) regarding likely impacts on the receiving environment.

Note: Notification to the administering authority must be addressed to the manager and project manager of the local administering authority via email or facsimile.

**C75** The holder must notify the administering authority as soon as practicable and no later than 24 hours after the cessation of a release notified under condition C74. Notification must include the submission of written advice to the administering authority of the following information:

- a) release cessation date/time
- b) volume of water released

- c) all in-situ water quality monitoring results
- d) any other matters pertinent to the water release event.

Note: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purpose of compliance with conditions C74 and C75, provided the relevant details of the release are included within the notification provided in accordance with conditions C74 and C75.

- C76** Within 28 days of a release notified under condition C74, the holder must provide a report to the administering authority demonstrating compliance with condition C71.

**Department interest: Noise**

**Noise nuisance**

- D1** Subject to conditions D2 and D3 noise from the mining activity must not cause an environmental nuisance at any sensitive or commercial place.
- D2** When requested by the administering authority, noise 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 authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.
- D3** If the environmental authority holder can provide evidence through monitoring that the limits defined in Table 20: Noise limits and Table 21: Airblast overpressure level, are not being exceeded then the holder is not in breach of condition D1. Monitoring must include:
- a)  $L_{A, \max \text{adj}, T}$
  - b) relevant background sound level
  - c) the level and frequency of occurrence of impulsive or tonal noise
  - d) atmospheric conditions including wind speed and direction
  - e) location, date and time of recording.
- D4** If monitoring indicates exceedance of the limits in Table 20: Noise limits and Table 21: Airblast overpressure level, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required
  - b) immediately implement noise abatement measures so that emissions of noise from the activity do not result in further environmental nuisance.

Table 20: Noise limits

Noise level dB(A)	Monday to Saturday			Sundays and public holidays		
	7 am–6 pm	6 pm–10 pm	10 pm–7 am	9 am–6 pm	6 pm–10 pm	10 pm–9am
	<b>Noise measured at a 'noise sensitive place'</b>					
$L_{A10, \text{adj, 10 mins}}$	B/g + 5	B/g + 5	B/g + 0	B/g + 5	B/g + 5	B/g + 0
$L_{A1, \text{adj, 10 mins}}$	B/g + 10	B/g + 10	B/g + 5	B/g + 10	B/g + 10	B/g + 5
	<b>Noise measured at a 'commercial place'</b>					
$L_{A10, \text{adj, 10 mins}}$	B/g + 10	B/g + 10	B/g + 5	B/g + 10	B/g + 10	B/g + 5
$L_{A1, \text{adj, 10 mins}}$	B/g + 15	B/g + 15	B/g + 10	B/g + 15	B/g + 15	B/g + 10

- a) Note: Where 'background' means background sound pressure level measured in accordance with the latest edition of the administering authority's Noise Measurement Manual. Table 20: Noise limits does not purport to set operating hours for the mining activities.

- D5** The method of measurement and reporting of noise levels must comply with the latest edition of the administering authority's Noise Measurement Manual.
- D6** If monitoring indicates exceedance of the relevant limits in condition D4, then the environmental authority holder must:
- address the complaint including the use of appropriate dispute resolution if required
  - immediately implement noise abatement measures so that emissions of noise from the activity do not result in further environmental nuisance.

#### **Vibration nuisance**

- D7** Vibration from the licensed activities must not cause an environmental nuisance, at any sensitive or commercial place.
- D8** When requested by the administering 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 authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.
- D9** Vibration monitoring must include the following descriptors, characteristics and conditions:
- location of the blast(s) within the mining area (including which bench level)
  - atmospheric conditions including temperature, relative humidity and wind speed and direction

c) location, date and time of recording.

**D10** If monitoring indicates exceedance of the relevant limits in Table 21: Vibration limits, then the environmental authority holder must:

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

**Table 21: Vibration limits**

Location	Vibration measured
Sensitive or commercial place	5 mm/s peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/s peak particle velocity at any time

Note: The method of measurement and reporting of vibration levels must comply with the latest edition of the administering authority vibration and air blast overpressure monitoring guideline.

**Airblast overpressure nuisance**

**D11** The airblast overpressure level from blasting operations on the premises must not exceed the limits defined in Table 22: Airblast overpressure level at any nuisance sensitive or commercial place.

**Table 22: Airblast overpressure level**

Location	Airblast overpressure measured
Sensitive or commercial place	Air blast overpressure level of 115 db (linear peak) for 9 out of 10 consecutive blasts initiated and not greater than 120 db (linear peak) at any time.

**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 authorised officer) of environmental nuisance at any sensitive or commercial place, and the results must be notified within 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 (including which bench level)
- b) atmospheric conditions including temperature, relative humidity and wind speed and direction
- c) location, date and time of recording.



- D14** If monitoring indicates exceedance of the relevant limits in Table 22: Airblast overpressure level, then the environmental authority holder must:
- a) address the complaint including the use of appropriate dispute resolution if required
  - b) immediately implement airblast overpressure abatement measures 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.

## Schedule E: Waste

### General

- E1** For the purpose of conditions E1 to E17, effluent, waste rock, spoil, overburden, rejects and tailings generated on mining lease (ML) 70370 are not defined as 'waste'.

### Storage of tyres

- E2** Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to-energy options must be stored in stable stacks and at least 10 metres from any other scrap tyre storage area, or combustible or flammable material, including vegetation.
- E3** All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 metre radius of the scrap tyre storage area.
- E4** Where no feasible recycling or waste-to-energy options are available, disposing of scrap tyres resulting from the mining activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as reasonably practicable.
- E5** Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

### Waste management

- E6** A waste management plan must be implemented and must:
- a) describe how the environmental authority holder recognises and applies the waste and resource management hierarchy in accordance with the *Waste Reduction and Recycling Act 2011*
  - b) identify characterisations of wastes generated from the project and general volume trends over the past five years
  - c) include a program for safe recycling or disposal of all wastes—reusing and recycling where possible
  - d) include waste commitments with auditable targets to reduce, reuse and recycle
  - e) the waste management control strategies must consider:
    - o the type of wastes
    - o segregation of the wastes
    - o storage of the wastes
    - o transport of the wastes
    - o monitoring and reporting matters concerning the waste
    - o emergency response planning
    - o disposal, reused and recycling options

- f) identify the potential adverse and beneficial impacts of the wastes generated
  - g) detail the hazardous characteristics of the waste generated (if any)
  - i) outline the process to be implemented to allow for continuous improvement of the waste management systems
  - j) identify responsible staff (positions) for implementing, managing and reporting the waste management plan
  - k) cover a staff awareness and induction program that encourages re-use and recycling.
- E7** Waste is not permitted to be disposed of within mining lease 70393.
- E8** General waste may be temporarily stored on mining lease 70393 before being directed to a facility that can lawfully accept such waste.
- E9** Subject to conditions E1 to E5, the following regulated waste may be temporarily stored on mining lease 70393 before being directed to a facility that can lawfully accept such waste:
- a) tyres
  - b) batteries
  - c) hydrocarbons
  - d) oils
  - e) oil interceptor sludges
  - f) oil water emulsions and mixtures
  - g) chemicals listed under the *Environmental Protection Act 1994* and subordinate legislation.
- E10** A designated area or storage containers must be set aside for the laydown and segregation of wastes.
- E11** An effective fire break must be provided and maintained around all waste laydown areas.
- E12** All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 metre radius of all waste laydown areas.
- E13** Waste must not be burned or allowed to be burned on the mining lease unless by approval of the administering authority.
- E14** Waste batteries must be stored:
- a) in a bunded and roofed area, or
  - b) palletised and plastic wrapped.
- E15** A record of all wastes must be kept detailing:
- a) date of pickup of waste
  - b) description of waste

- c) quantity of waste
- d) origin of the waste
- e) destination of the waste.

Note: Trackable wastes as listed in Schedule 1 of the Environmental Protection (Waste Management) Regulation 2000 are not covered by this condition. Trackable wastes have similar recording requirements to this condition in accordance with a waste tracking system established under the above regulation.

- E16** All regulated waste removed from the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*.
  
- E17** Each container of regulated waste must be marked to identify the waste contained therein.

**Schedule F: Land**

**Topsoil**

- F1** Topsoil must be strategically stripped ahead of mining in accordance with a topsoil management plan.
- F2** A topsoil inventory which identifies the topsoil requirements for the Ellensfield Coal Mine and availability of suitable topsoil on site must be detailed in the plan of operations.

**Preventing contaminant release to land**

- F3** Contaminants must not be released to land in a manner which constitutes nuisance, material or serious environmental harm.
- F4** The environmental authority holder must take all practicable actions necessary to secure loads prior to transporting materials off site to minimise emissions or spillage of any material from vehicles or other transport infrastructure.

**Chemicals and flammable or combustible liquids**

- F5** All flammable and combustible liquids 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 edition of AS 1940—Storage and Handling of Flammable and Combustible Liquids.
- F6** Spillage of all flammable and combustible liquids must be controlled in a manner that prevents environmental harm.
- F7** 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.
- F8** Spillage of all chemicals must be controlled in a manner that prevents environmental harm.
- F9** All explosives, corrosive substances, toxic substances, gases and dangerous goods must be stored and handled in accordance with the relevant Australian standard.

**F10** All chemicals and flammable or combustible liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian standard is available, the following must be applied:

- a) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110 per cent of a single storage tank or 100 per cent of the largest storage tank plus 10 per cent of the second largest storage tank in multiple storage areas
- b) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25 per cent of the maximum design storage volume within the bund.

**Spill kit**

**F11** An appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes, chemicals and flammable and combustible liquids associated with the activity must be kept at the site.

**F12** Anyone operating with wastes, chemicals or flammable and combustible liquids under this approval must be trained in the use of the spill kit.

**Infrastructure**

**F13** 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.

**Rehabilitation landform criteria**

**F14** Land disturbed by mining must be rehabilitated in accordance with Table 23: Rehabilitation requirements.

**Table 23: Rehabilitation requirements**

Mine domain	Mine feature name	Rehabilitation goal	Rehabilitation objectives	Indicators	Completion criteria <sup>1</sup>
*	*	*	*	*	*
*	*	*	*	*	*
*	*	*	*	*	*
*	*	*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes

**F15 Rehabilitation landform criteria**

All areas significantly disturbed by mining activities must be rehabilitated to a stable landform with a self-sustaining vegetation cover in accordance with Table 24: Final land use and rehabilitation approval schedule and Table 25: Landform design criteria.

**Table 24: Final land use and rehabilitation approval schedule**

Details	Disturbance type					
	Subsided areas	Ponded areas (>1.25 metre)	Worked water dam/s	Infrastructure	ROM, topsoil material stockpiles	Road(s) and tracks
Projective surface area (ha)*	*	*	*	*	*	*
Map reference	*	*	*	*	*	*
Pre-mine land use	*	*	*	*	*	*
Post-mine land use	*	*	*	*	*	*
Post-mine land capability classification	*	*	*	*	*	*
Projective cover range (%)	*	*	*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes

**Table 25: Landform design criteria**

Disturbance type	Maximum slope range %	Projective surface area (ha)
Subsided landform	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes

**F16** Progressive rehabilitation must commence within 12 months when areas become available within the operational land, and must be in accordance with the current plan of operations.

**F17** Self-sustaining vegetation, as per Table 23: Rehabilitation requirements, must be consistent with the reference sites identified in Table 26: Reference sites.

Table 26: Reference sites

Reference site	Domain reference	Northing (GDA94)	Easting (GDA94)	Description
*	*	*	*	*
*	*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes

### Post-mine land use plan

**F18** The holder must develop and submit to the administering authority a post-mine land use plan (PMLUP) with the initial plan of operations and update and resubmit the plan with each subsequent plan of operations. The PMLUP must describe how the rehabilitation objectives in Table 23: Rehabilitation Requirements will be achieved:

- a) schematic representation of final land form inclusive of drainage features
- b) drainage design
- c) erosion controls proposed on reformed land
- d) geotechnical, geochemical and hydrological studies
- e) chemical, physical and biological properties of soil and water
- f) proposed revegetation methods inclusive of plant species selection, re-profiling, respreading soil, soil ameliorants/amendments, surface preparation and method of propagation
- g) a rehabilitation monitoring program.

### Rehabilitation monitoring program

**F18** 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.

**F19** 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.

**F20** Verification of rehabilitation success is to be carried out as follows:

- a) The minimum sampling intensity must be specified for the monitoring of progressive rehabilitation.
- b) Justification of the suitability of the minimum sampling intensity must be provided.



- c) Monitoring must include sufficient replication to enable statistical analysis of results at an acceptable power.
- d) Monitoring must be undertaken at 12-monthly intervals.

- F21** 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 the rehabilitation management plan will be achieved
  - b) verification of rehabilitation success as per condition F15 and Table 24.

### **Post closure management plan**

- F22** A post-closure management plan for the site must be developed and submitted to the administering authority at least 18 months prior to the final coal processing on site and implemented for a nominal period of:
- a) at least 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.

- F23** 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 of spoil dumps
  - v. vegetative cover
- b) monitoring of:
  - i. surface water quality
  - ii. groundwater quality
  - iii. seepage rates
  - iv. erosion rates
  - v. the integrity and stability all slopes, ramps and voids
  - vi. the health and resilience of native vegetation cover.

- F13** Cleared vegetation from the site must be managed in accordance with the following hierarchy:

- a) reuse, e.g. use of logs and tree stumps as shelter for fauna in rehabilitated areas
- b) recycle, e.g. mulching of vegetation and use in rehabilitation on the site
- c) other alternative management options implemented in a way that causes the least amount of environmental harm.

- F14** 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.

**Exploration**

- F15** Disturbance due to exploration activities in areas not authorised to be mined must be rehabilitated in accordance with provisions detailed in the Code of Environmental Compliance for Exploration and Mineral Development Projects.

## Schedule G: Regulated structures

- G1** The hazard category of any structure must be assessed by a suitably qualified and experienced person:
- a) in accordance with the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams
  - b) in any of the following situations:
    - i. prior to the design and construction of the structure, or
    - ii. prior to any change in its purpose or the nature of its stored contents, and
    - iii. in accordance with the Manual for assessing Hazard Categories and Hydraulic Performance of Dams.
- G2** A hazard assessment report and certification must be prepared for any structure assessed and the report may include a hazard assessment for more than one structure.
- G3** The holder must, on receipt of a hazard assessment report and certification, provide to the administering authority one paper copy and one electronic copy of the hazard assessment report and certification.
- G4** Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.
- G5** The holder must take reasonable and practical measures so that each dam associated with the mining activity is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.
- G6** All regulated structures must be designed by, and constructed under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.
- G7** Construction of a regulated structure is prohibited unless the holder has:
- a) submitted a hazard category assessment report and certification to the administering authority
  - b) commissioned a suitably qualified and experienced person to prepare a design plan for the structure
  - c) received the certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this authority.

- G8** Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan, in the form set out in the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.
- G9** Regulated structures must be:
- a) designed and constructed in accordance with and conform to the requirements of the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams
  - b) designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:
    - i. floodwaters from entering the regulated dam from any watercourse or drainage line
    - ii. wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
- G10** The design plan for a regulated structure must include, but is not limited to:
- a) certification that the design plan:
    - i. is in accordance with the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams, including subsidiary certifications if necessary
    - ii. addresses the requirements in G10(b) to (h)
  - b) a design report which provides:
    - i. a description of all the documents which constitute the design plan
    - ii. a statement of:
      - a. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents, relied upon in preparing the design plan
      - b. all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan
      - c. the hazard category of the regulated structure
      - d. setting out the reasoning of the suitably qualified and experienced person who has certified the design plan, as to how the design plan provides the necessary required performance
    - iii. documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities
    - iv. detailed criteria for the design, operation, maintenance and decommissioning of the regulated structure, including any assumptions
    - v. design, specification and operational rules for any related structures and systems used to prevent failure scenarios
  - c) drawings showing the lines and dimensions, and locations of built structures and land forms associated with the regulated structure
  - d) consideration of the interaction of the pit design with the levee or regulated dam design

- e) an operational plan that includes:
  - i. normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance)
  - ii. contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure
- f) a plan for the decommissioning and rehabilitation of the regulated structure at the end of its operational life
- g) details of reports on investigations and studies done in support of the design plan
- h) any other matter required by the suitably qualified and experienced person.

**G11** Certification by the suitably qualified and experienced person who supervises the construction must be submitted to the administering authority on the completion of construction of the regulated structure, and state that:

- a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure
- b) construction of the regulated structure is in accordance with the design plan.

**G12** Where a regulated dam is to be managed as part of an integrated containment system and the DSA volume is to be shared across the integrated containment system, the design and operating rules for the system as a whole must be documented in a system design plan that is certified by a suitably qualified and experienced person.

**G13** The system design plan must contain:

- a) the design plans
- b) the 'as constructed' plans
- c) the operational rules for each individual regulated dam that forms part of the integrated system
- d) the standards of serviceability and accessibility of water transfer equipment or structures
- e) the operational rules for the system as a whole.

### **Operation of a regulated structure**

**G14** Operation of a regulated structure is prohibited unless:

- a) the holder has submitted to the administering authority:
  - i. one paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition G7
  - ii. a set of 'as constructed' drawings and specifications
  - iii. certification of those 'as constructed drawings and specifications' in accordance with condition G8

- iv. where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan
- b) the requirements of this authority relating to the construction of the regulated structure have been met
- c) Relevant details for the dam have been included in Table 26: Location of regulated structures and Table 27: Basic details of regulated dams of this authority.

**G15** Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan, and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.

**G16** The holder must take reasonable and practicable control measures to prevent the causing of harm to persons, livestock or wildlife through the construction and operation of a regulated structure. Reasonable and practicable control measures may include, but are not limited to:

- a) the secure use of fencing, bunding or screening
- b) escape arrangements for trapped livestock and fauna.

### **Mandatory reporting level**

**G17** The mandatory reporting level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

**G18** The holder must, as soon as practical and within 48 hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the Mandatory Reporting Level.

**G19** The holder must, immediately on becoming aware that the Mandatory Reporting Level has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

### **Annual inspection report**

**G20** Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.

**G21** At each annual inspection, the condition and adequacy of all components of the regulated structure must be assessed:

- a) against the most recent hazard assessment report and design plan (or system design plan)
- b) against recommendations contained in previous annual inspections reports

- c) against recognised dam safety deficiency indicators
- d) for changes in circumstances potentially leading to a change in hazard category
- e) for conformance with the conditions of this authority
- f) for conformance with the 'as constructed' drawings
- g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems)
- h) for evidence of conformance with the current operational plan.

**G22** A suitably qualified and experienced person must prepare an annual inspection report containing details of the assessment and including recommended actions to ensure the integrity of the regulated structure.

**G23** The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.

**G24** The holder must:

- a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the regulated structure will safely perform its intended function
- b) within twenty business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.

**G25** A copy of the annual inspection report must be provided to the administering authority upon request and within ten business days.

### **Design storage allowance**

**G26** On 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume), to meet the design storage allowance (DSA) volume for the dam (or network of linked containment systems).

**G27** The holder must, as soon as possible and within 48 hours of becoming aware that the regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

- G28** The holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.

### **Performance review**

- G29** The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

- G30** The holder must take action to modify its water management or linked containment system so as to ensure that the regulated dam or linked containment system will perform in accordance with the requirements of this authority, for the subsequent November to May period.

Note: Action may include seeking the necessary approvals for physical modification of a regulated dam.

### **Transfer arrangements**

- G31** The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to any register of regulated structures, hazard assessment, design plan and other supporting documentation, to a new holder and the administering authority on transfer of this authority.

### **Decommissioning and rehabilitation**

- G32** Prior to the cessation of the environmentally relevant activity, each regulated dam must be decommissioned such that:

1. ongoing environmental harm is minimised by the regulated dam by:
  - (i) becoming a safe site for humans and animals at the completion of rehabilitation, and
  - (ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts, and
  - (iii) minimising the potential for leachate generation, or
  - (iv) being approved or authorised under relevant legislation for a beneficial use, or
  - (v) being a void authorised by the administering authority to remain after decommissioning, and
2. the regulated dam is compliant with all other relevant rehabilitation requirements of this authority.



**Regulated structures location and performance**

**G33** Each regulated structure named in Column 1, Table 26: Location of regulated structures must be wholly located within the control points noted in columns 2 and 3 of Table 26: Location of regulated structures, below, for that structure.

**Table 26: Location of regulated structures**

Name of regulated structure	Water type	Easting	Northing	Longitude	Latitude
*	*	*	*	*	*
		*	*	*	*
		*	*	*	*
		*	*	*	*
		*	*	*	*
*	*	*	*	*	*
		*	*	*	*
		*	*	*	*
		*	*	*	*
		*	*	*	*
*	*	*	*	*	*
		*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes after the hazard categories are reassessed.

<sup>1</sup> The 'name of the regulated structure' should refer to the name for example, process residue facility and decant dam.

<sup>2</sup>A minimum of three control points is required to constrain the location of all activities associated with the regulated structure. Additional infrastructure which forms part of any regulated dam may include appurtenant works consisting of seepage collections systems, runoff diversion bunds, containment systems, pressure relief wells, decant and recycle water systems. Note that details on tailing discharge pipelines would be included in this table only if they have not been included in the design plan required in condition x.

<sup>3</sup>This location reference is the reference for Table 26: Location of regulated structures flood level and crest level.

**G34** Each regulated dam named in column 1 of Table 26: Location of regulated structures, must be consistent with the details noted in columns 2 through to and including 7 of Table 27: Basic details of regulated dams, below, for that dam.

Table 27: Basic details of regulated dams

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of regulated dam <sup>1</sup>	Hazard category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam <sup>2</sup> at spillway (m)	Spillway level (mAHD)	Use of dam <sup>3</sup>
*	*	*	*	*	*	*
*	*	*	*	*	*	*
*	*	*	*	*	*	*
*	*	*	*	*	*	*
*	*	*	*	*	*	*
*	*	*	*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes after the hazard categories are reassessed.

<sup>1</sup> The name of the regulated dam should refer to the name of the dam, for example, process residue facility and decant dam and should be the same name used in Table 28: Location of Regulated Structures for the dam.

<sup>2</sup> For regulated dams which do not require a dam wall, input the maximum void depth, for example, where dams are formed by excavating below the land surface or backfilling a residual void.

<sup>3</sup> The use or purpose of the regulated dam should outline the designed function, for example, 'the permanent containment of tailings resulting from the extraction of nickel, cobalt and other metals at the XYZ refinery'.

**G35** Each regulated dam named in column 1 of Table 26: Location of regulated structures, must meet the hydraulic performance criteria noted in columns 2 through to and including 4 of Table 28: Hydraulic performance of regulated dams, below, for that dam.

Table 3: Hydraulic performance of regulated dams

Column 1	Column 2	Column 3	Column 4
Name of regulated dam	Spillway capacity AEP	Design storage allowance AEP	Mandatory reporting level AEP
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*
*	*	*	*

\*Table to be populated as part of the EM Plan assessment and EA generation processes after the hazard categories are reassessed.

### Definitions

Words and phrases used throughout this licence are defined below except where identified in the *Environmental Protection Act 1994* or subordinate legislation. Where a word or term is not defined, the ordinary English meaning applies, and regard should be given to the Macquarie Dictionary.

**Acceptance criteria** means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The acceptance criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly disturbed by the mining activities.

Acceptance criteria may include information regarding:

- a) vegetation establishment, survival and succession
- b) vegetation productivity, sustained growth and structure development
- c) fauna colonisation and habitat development
- d) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes
- e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration
- f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development
- g) resilience of vegetation to disease, insect attack, drought and fire
- h) vegetation water use and effects on ground water levels and catchment yields.

**Acid rock drainage** means any contaminated discharge emanating from a mining activity formed through a series of chemical and biological reactions, when geological strata is disturbed and exposed to oxygen and moisture as a result of mining activities.

**Administering authority** means the Department of Environment and Heritage Protection or its successor.

**Airblast overpressure** means energy transmitted from the blast site within the atmosphere in the form of pressure waves. The maximum excess pressure in this wave, above ambient pressure, is the peak airblast overpressure measured in decibels linear (dBL).

**Ambient (or total) noise** at a place, means the level of noise at the place from all sources (near and far), measured as the Leq for an appropriate time interval.

**ANZECC** means the Australian and New Zealand Guidelines for Fresh Marine Water Quality 2000

**Appropriately qualified person** means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

**Authority** means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

**Bed and banks** for a waters, river, creek, stream, lake, lagoon, pond, swamp, wetland or dam means land over which the water of the waters, lake, lagoon, pond, swamp, wetland or dam normally flows or that is normally covered by the water, whether permanently or intermittently; but does not include land adjoining or adjacent to the bed and banks that is from time to time covered by floodwater.

**Blasting** means the use of explosive materials to fracture:

- a) rock, coal and other minerals for later recovery, or
- b) structural components or other items to facilitate removal from a site or for reuse.

**Bunded** means within bunding consistent with Australian Standard 1940.

**Commercial place** means a work place used as an office or for business or commercial purposes, which is not part of the mining activity and does not include employees accommodation or public roads.

**Competent person** means a person with the demonstrated skill and knowledge required to carry out the task to a standard necessary for the reliance upon collected data or protection of the environment.

**Construction** includes building a new dam and modifying or lifting an existing dam.

**Design plan** is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam and includes a plan that manages an integrated containment system. The documents must include all investigation and design reports, drawings and specifications sufficient to hand to a contractor for construction, and planned decommissioning and rehabilitation outcomes; so as to address all hazard scenarios that would be identified by a properly conducted hazard assessment for the structure. Documentation must be such that a 'suitable qualified and experience person' could conduct an independent review without seeking further information from the designer.

**Dwelling** means any of the following structures or vehicles that is principally used as a residence:

- a) a house, unit, motel, nursing home or other building or part of a building
- b) a caravan, mobile home or other vehicle or structure on land
- c) a water craft in a marina.

**Effluent** means treated waste water discharged from sewage treatment plants.

**End-of-pipe** means the location at which water is released to waters or land.

**Environmental authority holder** means the holder of this environmental authority.

**Financial assurance** means a security required under the *Environmental Protection Act 1994* by the administering authority to cover the cost of rehabilitation or remediation of disturbed land or to secure compliance with the environmental authority.

**Floodwater** means water overflowing, or that has overflowed, from waters, river, creek, stream, lake, pond, wetland or dam onto or over riparian land that is not submerged when the watercourse or lake flows between or is contained within its bed and banks.

**Flowable substance** means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can include water, other liquids fluids or solids, or a mixture that includes water and any other liquids, fluids or solids either in solution or suspension.

**Foreseeable future** is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150-year period

**Infrastructure** means water storage dams, roads and tracks, buildings and other structures built for the purpose of mining activities but does not include other facilities required for the long-term management of mining impacts or the protection of potential resources. Such other facilities include dams, waste rock dumps, voids, or ore stockpiles and buildings as well as other structures whose ownership can be transferred and which have a residual beneficial use for the next owner of the operational land or the background land owner.

**LA 10, adj, 10 mins** means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10 per cent of any 10-minute measurement period, using Fast response.

**LA 1, adj, 10 mins** means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for one per cent of any 10-minute measurement period, using Fast response

**LA, max adj, T** means the average maximum A-weighted sound pressure level, adjusted for noise character and measured over any 10 minute period, using Fast response.

**Land capability** as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

**Land suitability** as defined in the DME 1995 Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland.

**Land use** term to describe the selected post-mining use of the land, which is planned to occur after the cessation of mining operations.

**Landfill** means land used as a waste disposal site for lawfully putting solid waste on the land.

**mg/L** means milligrams per litre.

**Mine-affected water** means the following types of water:

- i) pit water, tailings dam water, processing plant water
- ii) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the Environmental Protection Regulation 2008 if it had not formed part of the mining activity
- iii) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an erosion and sediment control plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water
- iv) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated
- v) groundwater from the mine's dewatering activities
- vi) a mix of mine-affected water (under any of paragraphs i)-v)) and other water.

**Natural flow** means the flow of water through waters caused by nature.

**Nature** includes:

- a) ecosystems and their constituent parts
- b) all natural and physical resources
- c) natural dynamic processes.

**Noxious** means harmful or injurious to health or physical well being.

**Offensive** means causing reasonable offence or displeasure; is disagreeable to the sense; disgusting, nauseous or repulsive, other than trivial harm.

**Operational land** means the land associated with the project for which this environmental authority has been issued.

**Palletised** means stored on a movable platform on which batteries are placed for storage or transportation.

**Peak particle velocity (ppv)** means a measure of ground vibration magnitude which is the maximum rate of change of ground displacement with time, usually measured in millimetres/second (mms<sup>-1</sup>).

**Probable maximum flood (PMF)** is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

**Progressive rehabilitation** means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as mining operations are ongoing.

**Receiving environment** means all groundwater, surface water, land and sediments that are not disturbed areas authorised by this environmental authority.

**Receiving waters** means all groundwater and surface water that are not disturbed areas authorised by this environmental authority.

**Reference site** (or analogue site) may reflect the original location, adjacent area or another area where rehabilitation success has been completed for a similar biodiversity. Details of the reference site may be as photographs, computer generated images and vegetation models etc.

**Rehabilitation** the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the acceptance criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

**Representative** means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.

**Saline drainage** the movement of waters, contaminated with salt(s), as a result of the mining activity.

**Self sustaining** means an area of land which has been rehabilitated and has maintained the required acceptance criteria without human intervention for a period nominated by the administering authority.

**Sensitive place** means:

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises
- b) a motel, hotel or hostel
- c) an educational institution

- d) a medical centre or hospital
- e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area
- f) a public park or gardens.

**Sewage** means the used water of person's to be treated at a sewage treatment plant.

**Stable** in relation to land, means land form dimensions are or will be stable within tolerable limits now and in the foreseeable future. Stability includes consideration of geotechnical stability, settlement and consolidation allowances, bearing capacity (trafficability), erosion resistance and geochemical stability with respect to seepage, leachate and related contaminant generation.

**Stormwater** means all surface water runoff from rainfall.

**Suitably qualified and experienced person** in relation to dams means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, or at the relevant time holds a 'deemed registration' within the meaning of the *Mutual Recognition (Queensland) Act 1992*; and has knowledge, suitable experience and demonstrated expertise in relevant fields, as set out below:

- (a) knowledge of engineering principles related to the structures, geomechanics, hydrology, hydraulics, chemistry and environmental impact of dams
- (b) a total of five years of suitable experience and demonstrated expertise in the geomechanics of dams with particular emphasis on stability, geology and geochemistry
- (c) a total of five years of suitable experience and demonstrated expertise each, in three of the following categories:
  - investigation and design of dams
  - construction, operation and maintenance of dams
  - hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology
  - hydraulics with particular reference to sediment transport and deposition, erosion control, beach processes
  - hydrogeology with particular reference to seepage, groundwater
  - solute transport processes and monitoring thereof
  - dam safety.

**Water quality** means the chemical, physical and biological condition of water.

**Waters** includes:

- a) river, creek, stream in which water flows permanently or intermittently either:
  - i. in a natural channel, whether artificially improved or not, or
  - ii. in an artificial channel that has changed the course of the river, creek or stream, or
- b) lake, lagoon, pond, swamp, wetland, dam, or
- c) unconfined surface water, or
- d) storm water channel, storm water drain, roadside gutter, or



- e) bed and banks and any other element of a river, creek, stream, lake, lagoon, pond, swamp, wetland, storm water channel, storm water drain, roadside gutter or dam confining or containing water, or
- f) groundwater, or
- g) non-tidal or tidal waters (including the sea), or
- h) any part thereof.

**µg/L** means micrograms per litre

**µS/cm** means microsiemens per centimetre

**20<sup>th</sup> percentile flow**” means the 20<sup>th</sup> percentile of all daily flow measurements (or estimations) of daily flow over a 10-year period for a particular site. The 20<sup>th</sup> percentile calculation should only include days where flow has been measured (or estimated), i.e. not dry weather days.