



**Environmental Impact Statement
Assessment Report under the
Environmental Protection Act 1994
for the Foxleigh Plains Project**

Proposed by Anglo Coal (Foxleigh) Pty Ltd, CAML
Resources Pty Ltd and Nippon Steel Australia Pty Ltd

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 for the Foxleigh Plains Project (the project) according to Chapter 3 of the *Environmental Protection Act 1994* (EP Act). The project proponent is a joint venture originally comprised of CAML Resources Pty Ltd (60 per cent), Anglo Coal (Foxleigh) Pty Ltd (30 per cent) and at the time of the original application ICRA Foxleigh Pty Ltd. In 2012 ICRA was replaced by Nippon Steel Australia Pty Ltd (10 per cent).

The EIS process was initiated by an application made by the proponent on 8 March 2010 for approval to voluntarily prepare an EIS under the EP Act for the proposed expansion of the existing Foxleigh coal mine.

On 28 May 2010 the project was declared a controlled action (EPBC2010/5421) under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Commonwealth decided that the project was to be assessed through the EP Act EIS process under An Agreement Between the Commonwealth and the State of Queensland Under Section 45 of the *Environment Protection And Biodiversity Conservation Act 1999* Relating to Environmental Assessment (the bilateral agreement). The controlling provisions are listed threatened species and communities (sections 18 and 18A) (clearing of up to 2276ha of habitat for the threatened Squatter pigeon).

This EIS assessment report therefore contains an assessment of the significance of impacts of the project on the controlling provisions (refer to Chapter 4.13). 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 of Environment and Heritage Protection (EHP) 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 EHP must consider when preparing an EIS assessment report and Section 59 states that the content of the report must:

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

The purpose of this EIS assessment report is to:

- Provide an assessment of the project EIS documentation to complete the EIS process under Section 60 of the EP Act.
- 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 description

The project is an expansion of the current Foxleigh Mine that would increase run of mine (ROM) production to four million tonnes per annum (Mtpa), generate 3.2Mtpa of product coal and increase the life of the mine by up to 15 years. The development of the project would require the proponent to apply for an amendment of its environmental authority (EA)(MIN100734308) for the existing Foxleigh open cut mine. The EIS initially proposed to include Foxleigh Area 4, however that element of the project was later withdrawn from the EIS process to be advanced in another process. There are co-development agreements being drafted with separate parties for the purpose of accessing the gas resources across the project site. Those agreements are not finalised but the EIS stated that they will be executed at the time of determining the mining lease applications (MLA) for this project. The EIS did not include an assessment of potential actions under co-development arrangements.

2.1 Site description

The project site comprises three MLA areas (MLA 70429, MLA 70430 and MLA 70431) which cover approximately 3900ha across two separate pastoral properties. The northern boundary of the project site is located approximately 5.3km south-east of the township of Middlemount. The project site adjoins the existing Foxleigh Mine site to the south and is surrounded by grazing land to the north, west and east. The project site is in the Isaac Regional Council (IRC) area.

The project site is generally flat to undulating and is traversed by two ephemeral creeks, Cockatoo Creek in the east and Roper Creek in the west. Much of the project site has been cleared in the past for grazing, although there are areas of remnant woodland vegetation remaining, particularly along Cockatoo Creek and other drainage lines. The project site is currently used for beef cattle grazing and is surrounded by other mining operations and pastoral properties.

The majority of the land within the project site forms part of grazing properties owned by two private landowners. There are smaller parcels of land within the project site owned by the following entities: the IRC, Ergon Energy Corporation Ltd, Arrow Energy Pty Ltd and AGL Energy Ltd (for the proposed Central Queensland gas pipeline), and BHP Coal Pty Ltd and partners (for the Bingegang Weir water pipeline).

The Foxleigh Plains Project site is traversed by two roads, namely the Barwon Park–Middlemount Road and the Foxleigh Road. A water pipeline, an electricity transmission line, access tracks and the approved route for the Central Queensland gas pipeline traverse the project site. The EIS states that roads, a stock route and possibly the water pipeline will require realignment as a result of the project; however the EIS does not consider the potential impacts of those unresolved actions.

The project would involve expansion of the existing Foxleigh open cut mining operations, through development of new mining areas referred to as Foxleigh Plains and Eagles Nest. Coal would be extracted using truck and shovel mining methods similar to the mining methods at the existing Foxleigh Mine. An additional workforce of 90 employees would be required during project operations.

The project would involve the following activities:

- Clearing of any vegetation
- Stripping and stockpiling of topsoil
- Drilling and blasting of overburden
- Overburden removal using truck and shovel
- Coal mining using truck and shovel
- Progressive rehabilitation of overburden emplacement areas.

The project would make use of the current Foxleigh Mine infrastructure for processing and exporting coal, however new facilities and infrastructure would be required on site including:

- a mine industrial area (MIA)
- ROM coal stockpiles
- mine access and haul roads
- development of open cut pits and overburden emplacement areas
- water and flood management infrastructure.

Coal would be hauled by truck from the open cut pits to the existing Foxleigh coal handling and preparation plant (CHPP). The existing CHPP has sufficient capacity for 4Mtpa of ROM so no upgrade would be required. Rejects from the CHPP would continue to be stored in pit voids. Tailings generated by the CHPP would continue to be pumped via pipeline to the existing in-pit tailings storage within the existing Foxleigh Mine site (at ML70171).

Approximately 3.2Mtpa of product coal would be transported from the CHPP to the train load out facility at German Creek Mine, via an existing privately owned haul road. The train load out facility has sufficient capacity to load product coal from the expanded operations, no upgrading of this facility would be required. Coal would be transported by rail to Dalrymple Bay Coal Terminal (DBCT) for export. The EIS states that the current rail and port agreements allow for the product coal to be transported without the need for upgrades to either rail or port infrastructure.

The project would require an approximately 4.5km long diversion of Cockatoo Creek and the construction of two flood protection levees to minimise the risk of pit flooding.

The Foxleigh Plains pit would be approximately 700m wide with a total length of approximately 7km. This pit would be mined in blocks ranging from approximately 630–920m in length. Pit depth would average approximately 150m. The two Eagles Nest pits would each be approximately 750m wide with a total length of approximately 4.2km. These pits would be mined in blocks ranging from approximately 600–980m in length. Pit depths would average approximately 150m. Three final voids of approximately 150m depth would remain at the end of operations.

Each 4Mtpa of ROM extracted would require approximately 100Mtpa of overburden to be mined and generate 0.5Mtpa of coarse rejects, 0.15Mm³pa of tailings and approximately 3.2Mtpa of product coal.

The project would require approximately:

- 22.8GWhpa of electrical power, supplied via the existing Foxleigh mine 11Kv transmission line
- 24.75MLpa of diesel provided under contract and stored and used on site
- 2GLpa of external raw water provided by Sunwater through the Bingegang Weir pipeline
- 90MLpa of potable water provided under contract.

The proposed project would operate 24 hours per day 7 days per week and require a 15-year operation phase. A decommissioning phase will commence at year 16 and continue till an unspecified completion date.

The EIS stated that the project will target mainly the Middlemount seam within the Rangal Coal Measures, but also recover coals from the Pisces, Tralee and Roper seams when economic. The EIS states that the principal economic driver in deciding what seams to recover was ash content and the ability to wash the coal sufficiently to generate a suitable product.

3 The EIS process

3.1 Timeline

The EIS process was initiated by the proponent applying to EHP for approval to prepare a voluntary EIS under Section 70 of the EP Act. That application was received on 8 March 2010 and approved on 9 March 2010. The proponent submitted draft TOR on 23 March 2010. EHP reviewed the draft TOR and advised the proponent on 23 March 2010 that the draft TOR were not sufficient to allow the purposes of the EIS to be achieved and were not suitable for public notification. The proponent amended and re-submitted the draft TOR in June 2010. On 18 June 2010 EHP notified the proponent of its decision to publish the draft TOR in: *The Courier-Mail* on Saturday 19 June 2010; the *Miners Midweek* on Wednesday 23 June 2010; and the *Central Queensland News* on Wednesday 23 June 2010. Copies of the draft TOR were circulated to all advisory bodies. The comment period for the draft TOR extended from Monday 21 June 2010, until close of business on Friday 30 July 2010.

EHP received comments on the draft TOR from 13 advisory bodies/stakeholders during the comment period and three after the comment period ended. All comments, together with those provided by EHP itself, were forwarded to the proponent on 16 August 2010. EHP finalised the TOR on 7 October 2010, taking into account all comments and the proponent's response to those comments.

On 30 November 2011, EHP met with the proponent to discuss a potential amendment to the proposed EIS. The proponent requested that the portion of land referred to as the Foxleigh Area 4 MLA be excised from the EIS application. EHP agreed to this request and the TOR were subsequently amended (16 January 2012) to reflect the change to the project. The proponent also amended the Initial Advice Statement (IAS).

At that time the joint venture nominated as the proponent was modified to include Nippon Steel Australia Pty Ltd replacing ICRA Foxleigh Pty Ltd as included in the original application.

Because the change to the project would not result in any additional significant environmental impact, EHP did not consider it necessary to readvertise the amended TOR. Both the amended versions of the TOR and IAS were uploaded to EHP's website on 7 February 2012.

On 5 April 2012, the proponent submitted a draft EIS for EHP review. EHP compared the draft EIS to the final TOR and, on 9 May 2012, decided to allow the EIS to proceed. On 23 May 2012, EHP issued a notice of that decision to the proponent. The public submission period for the EIS was set at 30 business days, starting on Monday 4 June 2012 and continuing until close of business on Monday 16 July 2012.

EHP publicly notified the start of the submission period for the EIS on its website on Monday 4 June 2012, and the proponent publicly notified in the *Central Queensland News* on Friday 1 June 2012 and *The Australian* and *The Courier-Mail* on Saturday 2 June 2012. The proponent also provided copies of the public notice of the EIS to affected and interested persons.

EHP received 14 submissions on the EIS within the submission period. These included 10 submissions from state government departments and agencies, the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), the Mackay Regional Council, the Mackay Conservation Group, the Fitzroy Basin Association and the Capricorn Conservation Council. All 14 submissions were accepted in accordance with Section 55 of the EP Act. The submissions, together with a submission from EHP were forwarded to the proponent on 30 July 2012 for consideration and response.

The proponent was then required to provide a supplementary report (SEIS) responding to those submissions by 28 August 2012. On 23 August 2012 the proponent sought an extension of time to submit the SEIS by 9 October 2012. On 28 August 2012 that extension was agreed to under Section 56(3)(b) of the EP Act.

On 8 October 2012 the proponent sought a second extension of time to submit the SEIS by 15 November 2012. On 28 August 2012 that extension was agreed to under Section 56(3)(b) of the EP Act.

On 15 November 2012 the proponent provided a SEIS that included a response to submissions and an amended environmental management plan (EM plan). Copies of the SEIS were distributed for review to those advisory bodies/submitters who had made a submission on the EIS.

Reviewers advised EHP that there was a range of outstanding matters not adequately resolved by the SEIS. Consequently the proponent requested an extension to the EIS decision period in order to address the outstanding matters prior to EHP making a decision on the suitability of the EIS under Section 56A. That request was granted by EHP and (under Section 555 of the EP Act) a new decision date set at 25 February 2013, on the condition that the proponent would provide the outstanding information by 25 January 2013.

On 23 January 2013 the proponent made a second request to extend that time, proposing to submit the additional information by 22 February 2013. On 24 January 2013, EHP again agreed under Section 555 to extend its decision

period until 22 March 2013, on the condition that the proponent would provide the additional information by 22 February 2013.

On 20 February 2013, the proponent made a third request to extend that time, proposing to submit the additional information by 5 April 2013. On 21 February 2013 EHP agreed under Section 555 to extend its decision period until 6 May 2013, on the condition that the proponent would provide the additional information by 5 April 2013.

On 5 April 2013, the proponent provided the additional information and EHP circulated it to all advisory bodies/submitters having outstanding concerns. Taking account of responses, on 6 May 2013 a decision under S56A was made that the EIS could proceed under Division 5 (EIS assessment report) and Division 6 (Completion of process) of the EP Act. That decision was made on the basis that, while there were still some unresolved matters, those matters could suitably be addressed either prior to the granting of an EA for the project or otherwise within the decision making period for the EPBC decision for the project. Outstanding matters are specifically discussed in further chapters of this report. A notice of the decision to allow the submitted EIS to proceed was issued to the proponent on 20 May 2013.

In the preparation of this EIS assessment report, EHP considered submissions and comments from members of the advisory body (refer Chapter 3.3.2 for advisory body constituents) and other submitters made at all stages of the EIS process. The EIS assessment report will be made available on EHP's website (www.ehp.qld.gov.au).

3.2 Approvals

Development of the project would require an amendment under the EP Act to EA MIN100734308 for the existing Foxleigh Mine. The relevant environmentally relevant activities (ERAs) associated with the expansion are shown in Table 1—Project approvals, along with other approvals required for the project. The range of relevant ERA's has changed since the EIS was originally prepared because of amendments to the EP Act and regulations, only current ERA's are listed here.

Table 1—Project approvals

Approval	Legislation (administering authority)
Environmental authority (mining activities) inclusive of environmentally relevant activities for: Drilling, costeaning, pitting or carrying out geological surveys causing significant disturbance (ERA 1), Mining black coal (ERA 5), Chemical storage (ERA 8), Fuel burning (ERA 15), Surface coating (ERA 38), Regulated waste storage (ERA 56), Waste disposal (ERA 60) and Sewage treatment (ERA 63).	<i>Environmental Protection Act 1994</i> (Department of Environment and Heritage Protection)
Plan of Operations	<i>Environmental Protection Act 1994</i> (Department of Environment and Heritage Protection)
Mining Leases (MLA 70429, MLA 70430 and MLA 70431 for mining and infrastructure)	<i>Mineral Resources Act 1989</i> (Department of Natural Resources and Mines)
Cultural Heritage Management Plan	<i>Aboriginal Cultural Heritage Act 2003</i> (Department of Natural Resources and Mines)
Diversion of Cockatoo Creek.	<i>Water Act 2000</i> (Department of Natural Resources and Mines)
Approval to undertake action that may impact on a matter of national environmental significance (nationally listed threatened species and ecological communities)	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth Department of Sustainability, Environment, Water, Population and Communities)
Exemption for removal of least concern species	<i>Nature Conservation Act 1992</i> (Department of Agriculture, Fisheries and Forestry)

Note: Table 1 does not necessarily list all legislative approvals required.

3.3 Consultation program

3.3.1 Public consultation

In addition to the statutory requirements for advertising of the TOR and EIS and providing written notification to interested and affected parties, the proponent consulted members of the public and held meetings in Brisbane and the region during the public submission period of the EIS.

The proponent's EIS consultation process included the following phases:

- stakeholder identification
- issue scoping
- issue response and feedback.

3.3.2 Advisory body

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

- former Department of Environment and Resource Management
- former Department of Housing
- former Department of Infrastructure and Planning
- former Department of Mines and Energy
- former Department of Primary Industries and Fisheries
- former Commonwealth Department of the Environment, Water, Heritage and the Arts
- former Department of Employment, Economic Development and Innovation
- former Queensland Rail
- former Treasury Department
- former Department of Communities
- Queensland Health
- Queensland Police Service
- Department of Community Safety
- Department of Transport and Main Roads
- Queensland Treasury and Trade
- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
- Department of Education Training and Employment
- Department of State Development, Infrastructure & Planning
- Department of Housing and Public Works
- Department of Agriculture, Fisheries and Forestry
- Department of Natural Resources and Mines
- Department of Science, Information Technology, Innovation and the Arts
- QR National/Aurizon
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities
- Isaac Regional Council
- Mackay Regional Council
- Capricorn Conservation Council
- Fitzroy Basin Association

- Mackay Conservation Group Inc.
- SunWater
- Ergon Energy
- Construction, Forestry, Mining & Energy Union
- Southern Barada Barna & Kabalbara (SBK) People
- Mackay and Whitsunday Bird Observation and Conservation Australia.

Advisory body briefings were held in Middlemount on 12 June 2012 and in Brisbane on 19 June 2012.

3.3.2.1 Queensland Government changes

In accordance with the Public Service Departmental Arrangements Notice (No.1) 2012, numerous changes to the names and roles of Queensland Government departments became effective on 3 April 2012. A table of the changes of the departments relevant to this assessment is provided as Annexure A to assist in interpreting the pre- and post-name relationships.

3.3.3 Public notification

In accordance with the statutory requirements of the EP Act EIS process, public notices of the draft TOR and EIS were advertised in *The Courier-Mail*, the *Central Queensland News* and on EHP's website.

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

- EHP website (draft TOR only)
- EHP business centre, Level 3, 400 George Street, Brisbane (draft TOR only)
- EHP office, 99 Hospital Road, Emerald
- Isaac Regional Council Library, Shopping Centre, Middlemount
- Anglo Coal (Foxleigh) Pty Ltd, Level 11, 201 Charlotte Street, Brisbane.

3.4 Matters considered in the EIS assessment report

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

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

These are addressed in the following subsections.

3.4.1 The final TOR

The final TOR, issued on 16 January 2011 and amended on 16 January 2012, were considered when preparing this EIS assessment report. Although compiled to include all the likely significant issues, the TOR stated that if other significant matters arose during the preparation of the EIS then such issues should be fully included. All such matters have been considered in the EIS assessment report.

3.4.2 The submitted EIS

An EIS was submitted in May 2012 and released for public submissions.

EHP accepted 14 submissions on the EIS from the following:

- Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
- Department of Natural Resources and Mines
- Department of Energy and Water Supply

- Department of Transport and Main Roads
- Department of Community Safety
- Department of Housing and Public Works
- Department of Education, Training and Employment
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities
- Department of State Development, Infrastructure and Planning
- Queensland Police Service
- Mackay Conservation Group
- Mackay Regional Council
- Fitzroy Basin Association
- Capricorn Conservation Council.

EHP also made its own submission on the EIS.

The proponent responded to those submissions and all submitters were given the opportunity to provide a follow-up response to EHP on their view of the suitability of the proponent's response to their submissions.

The proponent's initial response was not considered adequate, so an additional supplementary report was sought. That was distributed to stakeholders for assessment before the EIS was accepted as suitable to proceed.

The submitted EIS that is assessed here was therefore comprised of:

- the EIS that was made available for public submissions on 4 June 2012
- all properly made submissions
- responses to submissions and amendments to the EIS and draft Environmental Management Plan (supplementary reports) received on 15 November 2012 and 5 April 2013.

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 prescribed matters, under the Environmental Protection Regulation 2008, are considered when making an environmental management decision for this project:

- Section 51, matters to be considered for environmental management decisions
- Section 52, conditions to be considered for environmental management decisions
- Section 53, matters to be considered for decisions imposing monitoring conditions
- Section 55, release of water or waste to land
- Section 56, release of water, other than stormwater, to surface water
- Section 57, release of stormwater
- 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 notifiable activities that would apply to the project under schedule 3 of the EP Act. Those activities are:

- Notifiable activity 1 - Abrasive blasting
- Notifiable activity 6 - Chemical manufacture or formulation
- Notifiable activity 7 - Chemical storage
- Notifiable activity 14 - Engine reconditioning works
- Notifiable activity 23 - Metal treatment or coating
- Notifiable activity 24 - Mine wastes
- Notifiable activity 29 - Petroleum product or oil storage.

The proponent is required to notify EHP of all notifiable activities so that impacted sites can be included on the Environmental Management Register (EMR) or the Contaminated Lands Register (CLR). The identified notifiable activities should be clearly listed in the EM plan. Land contamination is discussed in more detail in Chapter 4.5.5.

3.5 Environment Protection and Biodiversity Conservation Act 1999

On 29 March 2010, the proponent referred the project to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). On 28 May 2010, SEWPaC determined the project to be a controlled action pursuant to Section 75 of the EPBC Act. The relevant controlling provisions related to listed threatened species and ecological communities (Sections 18 and 18A of the EPBC Act). The decision included that the project has the potential to impact matters of national environmental significance (MNES) as it would involve the clearing of up to 2,276 ha of suitable habitat for the nationally threatened Squatter Pigeon (*Geophaps scripta scripta*).

MNES are further discussed in Chapter 4.13 of this EIS assessment report.

This EIS process is accredited for the assessment under Part 8 of the EPBC Act in accordance with the bilateral agreement. SEWPaC 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 EIS assessment report will be given to the Commonwealth Environment Minister to assist in making a decision on the project under the EPBC Act.

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 also adequately identified the necessary approvals and outlined the assessment and approvals process.

4.2 Project need and alternatives

This section of the EIS adequately described the project need and alternatives and briefly outlined its social, economic and environmental benefits and costs, which were also addressed in more detail in later sections of the EIS. Alternatives were discussed, including alternative resources and feasible mining methods and the advantages of the preferred (open cut) method. The EIS stated that underground mining was unsuitable due to the steeply dipping and variable thickness of the target coal seams and the presence of complex faults.

The positive and negative impacts, appropriate mitigation and management measures and environmental protection commitments of the project were addressed in later sections of the EIS.

4.3 Project description

The EIS adequately described the location, scope and schedule for the project. The EIS included a detailed discussion of the geology, resource utilisation and mine infrastructure. A brief outline of the project as reported in the EIS is provided in Chapter 2 of this report.

4.4 Climate

The EIS suitably described the local sub-tropical climate of the site. The principal climatic aspects were the effect of extremely variable seasonal rainfall on water management on site and need for management measures to prevent the release of unauthorised contaminants from the site, flood protection levee design and the effect of wind on dust and noise. Climatic aspects that could affect the potential for environmental impacts and risks and the management of operations at the site were addressed in other chapters of the EIS.

4.5 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 summarise some of the conclusions.

4.5.1 Land disturbance

The project will result in significant land disturbance. Over approximately 2166ha of land will be directly disturbed by clearing activities associated with the project. The final landform will have significant impacts to the future use of the site, aspects of that issue are addressed in the following chapters.

4.5.2 Land use

The northern boundary of the project site is located approximately 5.3km south-east of the township of Middlemount. The project site adjoins the existing Foxleigh Mine site to the south and is surrounded by grazing land to the north, west and east. The project site is in the Isaac Regional Council (IRC) local government area and development is controlled by the provisions of the Broadsound Shire planning scheme. The project site and most of the surrounding land is zoned 'rural' under that scheme.

The majority of the land within the project site forms part of grazing properties owned by two private landowners. There are smaller parcels of land within the project site owned by the following entities: the IRC, Ergon Energy Corporation Ltd, Arrow Energy Pty Ltd and AGL Energy Ltd (for the proposed Central Queensland gas pipeline), and BHP Coal Pty Ltd and partners (for the Bingegang Weir water pipeline).

A stock route traverses the site. Much of the project site has been cleared for grazing, although there are areas of remnant woodland vegetation remaining, particularly along Cockatoo Creek and other drainage lines. The project site is currently used for beef cattle grazing and is surrounded by other mining operations and pastoral properties. EIS identified that there was no Strategic Cropping land on the site.

The project site is traversed by two roads, namely the Barwon Park–Middlemount Road and the Foxleigh Road. A water pipeline, an electricity transmission line, access tracks and the approved route for the Central Queensland

gas pipeline traverse the project site. The EIS stated that roads, a stock route and possibly the water pipeline will require realignment as a result of the project; however the EIS did not consider the potential impacts of those unresolved actions.

The region was historically dominated by cattle grazing, now coal mining is also regionally important. Middlemount is the closest town (~5km away) and Emerald the regional centre approximately 95km away, the EIS states that the project is compatible with existing land uses including the township of Middlemount and that for example dust and noise impacts will not have a significant impact on amenity at the town.

4.5.3 Soils and land suitability

The EIS did not suitably address some requirements relating to soils set out in the TOR. A number of matters (such as soil testing and mapping intensity, soil properties such as plant available water capacity, topsoil management plan and land suitability) were not fully resolved during the EIS process.

However the EIS included a commitment to complete the agreed scope of works, analysis and interpretation and to appropriately manage all soils encountered on the site if the operation proceeds.

Soil types and land suitability and agricultural land classes were assessed and the EIS determined that there were 12 soil types across the site and 1354ha of good quality agricultural land (Class C). The EIS states that the existing land suitability includes grazing and that the area is generally unsuitable for broadacre rainfed cropping.

Decommissioning strategies were not detailed in the EIS but a commitment was included that they would follow those for the existing Foxleigh Mine. Existing decommissioning strategies were stated to include demonstration of achieving site rehabilitation success criteria, bunding and fencing of high wall and end walls of final voids for safety purposes, reprofiling voids and ramps to be geotechnically stable, removal of infrastructure and reseeding MIA areas except where infrastructure deliberately remains for future land owners (for example roads).

4.5.3.1 Potential impacts

The EIS concluded that the risk of acid and saline runoff from overburden was low and would diminish further over time. Metal contents were found to be below relevant soil criteria and unlikely to present any significant rehabilitation or environmental issues. However, the EIS noted that overburden has lower organic content, poorer nutrient status, poorer structure and other properties adverse to vegetation growth, and concluded that the final landform would have an altered (reduced) capacity to support the original vegetation. Slope angles and lengths would be increased and this would result in an increased risk of soil erosion. Soil profiles and geotechnical stratigraphy would be altered resulting in lower quality material in the plant root zones. The EIS stated that overburden material would therefore require specific management to deliver rehabilitation outcomes.

Coal reject materials were similarly assessed and found to be low acid and low metal generating, however rejects would generate excess sulphate and salinity in runoff. Rehabilitation of tailings and rejects would require capping and finally topsoil dressing. There was no mention in the EIS of the success or practicality of this approach to presumably very moist and fine materials that may not dry or consolidate for extended periods of time.

The EIS stated that land suitability across the site would be degraded post-closure despite the proposed rehabilitation.

Post mining the area of good quality agricultural land (GQAL) will be reduced by 430ha and, after rehabilitation, land suitability generally would be degraded compared to pre mining case. The EIS stated that rehabilitated areas would support grazing apart from areas such as final voids, diversions, levees, and landform slopes which would all be unsuitable for pastoral activities. The EIS did not address the issue of grazing access to the significant areas of elevated landforms. The upper surfaces of those landforms may be confirmed as suitable for grazing but it appears that stock would not be able to access them as slopes are likely to create a barrier to stock movement. Consequently there are likely to be significant areas of the site that would effectively be unsuitable for grazing, despite their land suitability.

4.5.4 Resource utilisation

The project would target the Rangal coal measures and in particular the Middlemount seam, which is one of four seams in those measures. The EIS states that the seams are of variable thickness and that all are of economic interest. A summary of the Rangal coal measures at the project site is:

- Roper group between 0.5 and 1.8m thickness comprised of four seams at approximately 18m above the Middlemount seams.
- Middlemount group of average approximate thickness of 4.7m comprised of three seams at approximately 30m above the Tralee seams.

- Tralee group with two seams of average thickness of 4m at approximately 26m above the Pisces seams.
- Pisces group of two seams of average thickness of 3.2 .

The EIS described the site geology as a broad syncline that plunges and opens to the north, with the proposed mining areas based on the eastern and western limbs of that syncline. The project site coals include significant faulting and seam thickening and thinning, particularly in the eastern areas, and the EIS stated that typical seam thicknesses are hard to predict.

The EIS stated that additional close spaced drilling would be required to interpret and confirm the resource for the purposes of mine planning.

The EIS concluded that, based primarily on the Middlemount seam, the project would produce a high quality, mid-volatile pulverised coal injection (PCI) washed coal with an ash content of about 8.5 per cent. The Tralee seam in particular is stated to contain high ash content making washing to a suitable product less economic.

The EIS stated that the reserves have been calculated according to the JORC code and the estimated total resource across the four groups in the Rangal measures is 21.3Mt. A further blue sky estimate of 50Mt is included outside that JORC resource. The mine plan reserve presented in the EIS was 13.5Mt based on the pit and block plan, the EIS noted that the pit design would change as information was improved. Principal factors for resource utilisation were the stability of batters and the need for washing to reduce ash content in the final product.

The EIS stated that the Tralee and Pisces seams underlying the Middlemount seam would be sterilised where exploration data shows only the Middlemount seam would be economic for utilisation.

4.5.5 Land contamination

The EIS stated that a site history for the project was conducted and that the none of the project site was included on either the CLR nor the EMR, that there were no known contaminated sites on the site and no land uses relevant to contaminated land were identified for the site.

The range of notifiable activities proposed for the project were listed, including petroleum product or oil storage, mine wastes, metal treating or coating, engine reconditioning, chemical storage, chemical manufacture or formulation and abrasive blasting. The EIS noted that the currently 10 notifiable activities on the existing mine site would continue in order to support this project.

A range of actions to prevent the contamination of the site were included in the EIS and the EIS stated that after decommissioning the site would be in a condition that it would not be registered on the EMR/CLR and a long-term site management plan for contamination would not be required.

4.5.6 Landscape character and visual amenity

The EIS identified that the project would impact on residential amenity through dust, noise, odour and visual changes (profile of final landform and vegetation clearing) but concluded that none of those was likely to be significant.

The EIS included a visual impact assessment that considered the impacts of the project including screening of views, contrast between the project and landscape and the effects on views. The existing site was described as gently undulating with about 40m of vertical relief. The site includes two creeks and whilst predominantly cleared, does include vegetated stands of riparian vegetation mainly along Cockatoo Creek.

The local landscape is dominated by grazing land and some open cut mining operations. The main road is stated as being used for predominantly mining and agricultural traffic. The township of Middlemount was considered a sensitive visual receptor for the project and traffic on the Dysart-Middlemount road stated as a low sensitivity visual receptor.

The EIS noted that the post-mining landscape would change with the inclusion of the elevated landforms and the three final voids. The post mine landforms would include rehabilitated overburden piles revegetated primarily with grasses, and some smaller areas that would be planted with trees. The EIS states that the overburden emplacement features would be linear, with an approximately 30m maximum height, running parallel to the topographic trend for the area and that slopes would be controlled primarily for erosion purposes. The EIS committed to rehabilitation that would soften the landforms and ensure that they would not form conspicuous features.

The visual impact of the project was assessed as low due to the low relief of the landscape, low relief of the project (10m maximum for MIA and 40m maximum for the overburden emplacement areas) and screening by woodland vegetation that surrounds the town and some vegetation between the town and site. The EIS stated that mine lighting would not be visible from Middlemount other than a faint glow above the facilities.

A range of mitigation measures were proposed to minimise visual amenity impacts including limiting vegetation clearing, lighting design, selection of colours for infrastructure and progressive rehabilitation.

The preferred use of final voids was not specified and consequently the EIS did not identify conclusive management strategies for final void rehabilitation nor specify water quality objectives and drainage strategies. The EIS committed to preparing a final void report to resolve those matters.

4.6 Transport

4.6.1 Road

The EIS identified that the Barwon Park–Middlemount road would need to be realigned to the north however the environmental impacts of realignment of the road were not addressed in the EIS.

The EIS stated that the stock route that traverses the site (U408) would be managed to remain in operation across part of the mining lease and that an agreement would be established to manage that. No detail about that agreement was provided in the EIS.

4.6.2 Rail

The EIS stated that the project would utilise the existing Foxleigh Mine train load out facilities and rail loop for the loading and transport of product coal. These facilities have sufficient capacity to handle the predicted 3.2Mtpa of product coal from the project and would not require upgrading. Based on a typical coal train capacity of 9800t this would result in approximately 330 trains per year and an average of less than one additional train per day.

QR National/Aurizon was generally satisfied with the EIS, however has requested ongoing consultation on:

- dust control, particularly at the rail load out facility
- potential impacts of increased train movements on the rail system.

4.6.3 Port

The EIS stated that the preferred port for the export of the projects coal is Dalrymple Bay Coal Terminal (DBCT) and that DBCT is expected to reach a capacity of 85Mtpa following the completion of its expansion Stages 2 and 3. The EIS stated that the terminal currently has adequate rail, storage and shipping capacity to handle the 3.2Mtpa of product coal from this project.

4.6.4 Air

The EIS stated that no air services would be required by the project and that regional airport infrastructure and flights would not be impacted by the project.

4.7 Waste

The EIS stated that the project's environmental management objective for waste disposal would be to manage waste to avoid direct or indirect impacts to land, air and water. The EIS identified that the project's major sources of waste have the potential to cause impacts to the environment, including ecological processes and to human health and well-being if not appropriately managed.

4.7.1 Mine waste/waste rock and overburden

4.7.1.1 Overburden

Approximately 100Mt of waste rock and overburden would be generated each year to produce 4Mt of ROM coal. The waste is the consolidated and unconsolidated material including, topsoil strata that overlays the targeted coal resource. The EIS stated that overburden material would be generally alkaline, with low salinity, not acid-forming and therefore no acid mine drainage is expected from the overburden. The EIS stated that waste rock and overburden material is strongly sodic and likely to be prone to dispersion and unbalanced nutrient ratios, which may lead to macronutrient deficiencies and may influence the suitability of the material for use in revegetation and rehabilitation.

The EIS stated that during the operation of the Foxleigh Plains pit, overburden may be stored in an out-of-pit emplacement area, west of the Foxleigh Plains mining area. Subsequent mined overburden will be stored in in-pit emplacement areas. The EM plan did not set out a clear management regime for the disposal of potentially sodic

overburden.

4.7.1.2 Rejects and tailings

Approximately 0.5Mt of coarse rejects and 0.15Mm³ of fine tailings would be generated per year, or 7.7Mt and 2.5Mm³ respectively over the life of the project. Waste streams from the CHPP may produce poor quality saline and sulfate water runoff/seepage/leachate when placed. The EIS stated that coarse rejects may be blended with overburden for disposal or if not will be disposed with fine tailings within pits at the existing Foxleigh Mine area. The EIS stated that there is sufficient pit storage for those waste streams on the existing mine site.

4.7.2 Regulated waste

Regulated wastes generated by the project would include; hydrocarbon contaminated wastes/materials, batteries, tyres, spent fluorescent lighting tubes, ozone depleting substances, air conditioners, cleaning chemicals, vehicle wash down waters and detergents and paints and solvents from workshop activities.

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

4.7.3 Other waste

The EIS noted that the project would generate the following other waste streams:

- General waste including, timber and wooden pallets, green waste domestic, food scraps and non-recyclable plastics from crib rooms, office administration and workshops areas.
- Recyclable materials including, paper and cardboard, aluminium and steel cans, scrap metal from workshop, office administration areas and infrastructure maintenance.
- Green waste, including vegetation clearing from the development of the mine pits and associated infrastructure. Green waste would be either mulched, stockpiled in timber stacks to provide habitat or burnt.
- Sewage waste including sewage effluent and sewage sludge and residues from crib rooms and office administration areas.

4.7.4 Mitigation

The EIS included commitments to managing waste generated by the project in accordance with the waste management hierarchy (i.e. avoidance, reuse, recycling and disposal) and in accordance with relevant legislation including the Queensland Environmental Protection (Waste Management) Policy 2000 (EPP Waste).

The EIS committed to managing all waste so as to avoid any direct or indirect impacts on health and well-being of people and the environment on and surrounding the mine site, including a review of waste management practices on the mine site and keeping a register of hazardous material and their location on-site.

However the EIS did not provide a Waste Management Plan (WMP) for the project, nor a clear commitment to developing and implementing a WMP incorporating a program of best practice waste management including the ongoing assessment of cleaner production and waste management opportunities for the life of the project.

4.8 Water resources

4.8.1 Surface water

The project is located in the Mackenzie River catchment and the site is traversed by two ephemeral watercourses, Roper Creek and Cockatoo Creek. Roper Creek enters the Mackenzie River approximately 25km downstream from the project and this ultimately enters the Fitzroy River.

The Roper and Cockatoo Creek sub catchments to the downstream boundary of the project site are approximately 700 and 300km² respectively.

Environmental values for the surface waters were stated in the EIS as including human consumption and agricultural, industrial and recreational uses.

Water quality was assessed in the EIS as typical for lowland streams with slightly to moderately disturbed waters. Specifically the waters measured demonstrated low dissolved oxygen, high turbidity and high aluminium, though that was stated as typical of Fitzroy Basin conditions.

The EIS noted that numerous mines discharge to the watercourses and including the existing operation at Foxleigh. The monitoring data assessed was interpreted as generally meeting the ANZECC guideline levels for slightly to moderately disturbed ecosystems. There were significant differences between upstream and downstream sites for some parameters including pH, sulphate and EC. The differences were not well explained in the EIS but stated to be either natural or related to mine discharges.

The EIS stated that the primary mitigation of impacts to surface water would be achieved through:

- Internal drainage of mine affected areas to sedimentation dams or mine water storages.
- Segregation of unaffected water and its discharge off site.
- Sufficient storages for mine-affected water to minimise the need for controlled discharges.
- Integrated water management with the existing Foxleigh Mine.
- Minimising risk of controlled discharge through transfer of the mine affected water to other off site users.

4.8.2 Mine water management

The project would require additional water. Water management for the project would be integrated with the existing mine water management system. The EIS stated the principal strategies for water management would include minimisation of use of external raw water supply, minimise the risk of discharge of poor quality water and maximise the reuse of mine affected water. Water management on site would involve mine affected water, surface waters and externally supplied raw water. Mine affected water includes pit water, runoff from mine affected areas and process water including from the CHPP. Surface waters include in watercourses on site and runoff from rehabilitated and undisturbed areas.

The EIS stated that the tailings, overburden and waste rock from the site are acid consuming or non-acid forming and consequently runoff would not be acidic or contain dissolved metals. The diversion of waters around the mine areas and the storage of tailings in-pit with return of decant water for use as process water were stated as important parts of water management. Pit dewatering would be continual with mine affected water going to a range of in-pit and out-of-pit storages.

Excess water would be either transferred to adjacent mines or discharged to either Roper or Cockatoo Creeks under the EA for the existing operation. The maintenance of the existing discharge points at the existing operation was planned to allow for the management of any expansion related discharges to the same standard as the existing operation.

A raw water dam and 'admin' dam would accept raw water piped from Bingeang Weir. The existing raw water allocation is 980 megalitres per annum (MLpa) and an optional 309MLpa. An additional external allocation of 700MLpa raw water is stated as being necessary to adequately address the increased rate of production. The source of that water has not been confirmed, however a range of options including SunWater, adjacent mining operations and improved efficiencies were suggested in the EIS.

The EIS stated that overburden emplacement areas would be progressively rehabilitated, that rehabilitated areas would be drained offsite via sediment control devices and that active mine areas, unrehabilitated areas and ROM coal stockpile areas would drain to the pit.

Infrastructure areas would be segregated into internally draining to a dedicated MIA dam and for uncontaminated areas and roadways external drainage via sediment control devices.

Surface flows from undisturbed areas would be diverted to flow to natural drainage systems.

4.8.2.1 Water storages

A range of new water storages would be required over the life of the project including catch dams, highwall dams and a single MIA dam. The proposed integrated mine water management system is a complex network of pits, voids, existing dams and new storages. New storages would include:

- MIA dam from which water would be primarily used for dust suppression.
- Up to four highwall dams at any one stage and these would be moved as the project proceeds. Highwall dams would accept pit water and their water would be used for dust suppression.
- A minimum of three overburden catch dams at any stage. These would accept runoff from un-rehabilitated overburden emplacement areas. Their water would primarily be used for dust suppression.

An operational mine water simulation, including 121 years of rainfall data, was used in the EIS to assess water containment and water release needs, including regulatory compliance. It was noted that the average evaporation at the site was three times the long-term average rainfall.

The EIS committed to the design of the storages by a suitably experienced and qualified person in accord with the EHP guidelines and that all designs would include that spills and dam break scenarios would drain to a pit void and that all storages individually would not exceed 25 ML capacity or embankment heights of 8m. The EIS stated storages would be considered 'low' hazard category structures and not require regulation. The design storage allowance (DSA) calculation for the project was based on the combined capacity of the integrated water management system, the EIS noted that some individual storages did not meet the DSA required.

The proposed conditions in the EM plan indicated that the hazard categories, design storage allowance and mandatory reporting levels are not yet determined. That level of detail will be required at the EA application stage by way of a finalised EM plan.

The EIS stated that modelling indicated a low probability of uncontrolled discharge under long term rainfall scenarios and that there was a high probability of operational continuity without compromising DSA requirements.

The existing raw water supply allocation was modelled to provide for 90 per cent operational reliability under the increased production proposed. An additional external allocation of 700MLpa raw water is stated as necessary to adequately address the increased production. The source of that water has not been confirmed however a range of options including Sunwater, adjacent mining operations and improved efficiencies were suggested in the EIS.

4.8.3 Water discharges

The EIS stated that controlled discharge of mine affected water from the project is unlikely. However it was noted that the existing operation has approval for three discharge locations and the proposal is to integrate the water management of the project with that of the existing mine. An option to prevent discharges proposed in the EIS is to truck or transfer excess water to other operations, though no information about the reality of that was provided. The maintenance of the three discharge points at the existing operation was stated in the EIS as allowing any expansion contribution to water discharge to be managed to the same standard as the existing operation.

Discharges to Roper and Cockatoo Creeks could occur from sediment dams and it appears from schematics provided in the EIS that an uncontrolled spill from the process water dam could reach Roper Creek via a sediment dam, though the potential for this has not been discussed in the EIS.

Secondary treated sewage effluent is currently irrigated on the existing mine site and the EIS proposed a continuation of this, or the introduction of a package treatment plant on the project site.

4.8.4 Water monitoring

The current monitoring includes four upstream and three downstream monitoring locations to be monitored daily during waste water releases. Monitoring of water in storages would be quarterly. Monitoring proposed in the EIS would be similar to the existing operational water quality monitoring program, including development/augmentation of the existing Receiving Environment Monitoring Plan (REMP), with amendments as required to incorporate the submissions received on the EIS. A commitment was made in the EIS that the REMP would be finalised as part of the EA process after completion of the EIS. A Water Management Plan must also be developed for the project, to indicate how operational management of water and potential contamination would be conducted and reviewed.

4.8.5 Diversion and flood protection levees

The EIS assessed the surface water aspects of the project including geomorphology, hydrology and hydraulics.

The project would require an approximately 4.5km long diversion of Cockatoo Creek (disturbance footprint of approximately 125ha), to the east of the mine pit, and construction of two flood protection levees - one for each watercourse, approximately 5km for Foxleigh Plains/Cockatoo Creek and approximately 2km for Eagles Nest/Roper Creek.

The focus of the design of the diversion, stated in the EIS, was in developing a self-sustaining waterway that would re-establish Cockatoo Creek, to not impact off-site reaches and to ensure designs were suitable in the modelled flood events.

The Foxleigh diversion was designed to have an upstream section of low flow channel section with a downstream series of pools with no defined channel. The upstream section would be low to moderate sinuosity to match the geomorphology of the off take point, the downstream channel widened to accommodate the loss of flood plain associated with the pit mining. The channel was stated to be 15–20m top with a base width of 5–8m in the initial reach narrowing to a low flow channel with base channel of 2–4m where present. Channel depth would be approximately 3–4m throughout. The diversion would be maintained as close to the mine (west as possible) to maximise the area of existing flood plain that lies to the east of the diversion. In two-year ARI events the pools and channel would overtop and an ARI 20-year event would fill most of the flood plain (out to a 1km wide flood plain in 2000 year ARI).

The design proposed generally increased stream energy levels from existing values of low to moderate in the diversion. Whilst the EIS stated that the conceptual design achieved guideline criteria, reviewers noted locations of the diversion that would exceed the appropriate guideline criteria. These were associated with the off-take (commencement of diversion) end of the modelled diversion, as there had been no attempt to transition either end of the diversion and the existing creek. The EIS acknowledged this and stated that a detailed design would be completed to achieve full compliance and consideration of mitigation such as armouring at a later date.

Levee design was at a conceptual level of detail in the EIS, including: using compacted earth embankments; that there was a need to confirm the suitability of material on site to construct them; and that depending on materials the design would change at a detailed design stage.

The Eagles Nest levee was proposed to be at a height to suit either 2000 year ARI plus 0.1m freeboard, or 1000 year ARI plus 0.5m free board. No level was provided in the EIS for the Foxleigh levee. Both levees were shown by modelling to be engaged at the 20 year ARI event. There was a commitment in the EIS that flood protection levels would be redefined per EHP hazard categories guidelines prior to construction.

Reviewers of the EIS identified that there are ongoing issues at the existing operation related to the highly erodible nature of the on-site materials used in existing flood and surface water diversion levees and cracking zones at the top of pit walls. The EIS committed to the future detailed design of the levees prior to construction, including development of design, construction operational and decommissioning plans to be certified by suitably qualified and experienced person to meet the requirements of the EA and EHP guidelines where relevant.

Detailed revegetation and stabilisation was not presented, but the EIS included a commitment to completing that work at the detailed design stage.

A monitoring program was proposed to address all stages, from pre mining until post closure, to show whether the diversion was operating as a waterway in equilibrium and not impacting adjoining reaches, however no monitoring details were provided. A commitment was made in the EIS to provide the diversion monitoring program as part of the water diversion licence application.

4.8.6 Groundwater

The EIS considered groundwater on the basis of exploration bore hole data, groundwater monitoring on site, EHP data and a review of the local use of groundwater resources. The EIS stated that, whilst the site contained some geology that resembled that of the Great Artesian Basin (GAB), the project would not impact on the GAB because the site was 70km from the GAB management area and the geology is discontinuous with the GAB formations. The project would require the excavation of the Cockatoo Creek flood plain and a diversion of Cockatoo Creek.

The groundwater conceptualisation model utilised to interpret potential impacts of the project stated that the site included a synclinal basin and series of faults that effectively isolated the groundwater of the site to the immediate Foxleigh mining operation.

The principal groundwater resource identified was within the Permian coal measures. This groundwater was described in the EIS as having high electrical conductivity (EC) ranging from 29000–45000 μ S/cm, interpreted as resulting from high residence time of the water in the coals and stated as not suitable for use in stock watering.

There was found to be sparse groundwater within the alluvial Tertiary and Quaternary sediments across the site and directly associated with the creeks traversing the sites. The EIS stated that groundwater in those alluvial sediments would be recharged by direct rainfall and would flow according to topographical gradients and surface flows. The EIS also stated that there were no bores in or extraction from this alluvial groundwater resource within 5km of the site.

Groundwater recharge of the coal measures was stated to occur in areas of sub cropping where the coal seams intersected alluvial sediments, particularly, the stream bed sediments. Flows would be downward and North-west to the centre of the synclinal basin and therefore away from the local watercourses of Roper and Cockatoo Creeks. The EIS stated this prediction was supported by the significantly higher EC of the coal measures groundwater than the surface waters of those creeks and other pools.

Three private groundwater bores were identified as accessing groundwater within the coal measure aquifer within 5km of the site. One was in use for stock watering, one not serviced and one unused due to poor water quality. The EIS reported that the relevant property owner has access to alternative water supplies and that significant groundwater extraction did not occur within the area of potential groundwater influence of the proposal.

A principal statement in the EIS was that coal seams would act as the preferred pathway for groundwater flows and that the groundwater within the proposed expansion was going to interact with the existing Foxleigh mining operation, however the impact of the proposal on groundwater would not extend off site because the site geology included a syncline and major faulting that contained the groundwater boundaries to the site. The project's cumulative impact would be limited to an existing lowering of the groundwater within that synclinal basin that

commenced with the existing mining operation. The EIS stated that the areas of drawdown of the groundwater through pit dewatering would be laterally limited and could interact with that from the existing operation however would be limited to the site by the geology. The EIS did not state the level of groundwater drawdown nor specify the actual lateral extent of predicted groundwater drawdown.

Surface flows and pools were found to be ephemeral on the project site and the EIS interpreted this as demonstrating that groundwater from the coal measures does not provide base flow to surface waters. Consequently the EIS predicted that the project would not impact on surface flows or groundwater dependant ecosystems.

The EIS stated that post-mining, the final voids would receive limited groundwater inflow given the basin and faults and the principal water inputs would be from direct rainfall. Impacts from runoff from overburden and other areas would be avoided through rehabilitation design and erosion and sedimentation controls. The geology of the site would also limit any flow of pit water including potential contaminants to groundwater off site.

Reviewers of the EIS including (DEWS and DNRM) identified that the greatest risk of groundwater impacts from the project would be associated with the excavations at the northern limit and as water rose in the final void that groundwater levels could rise in the connected down dip Rangal coal measures and that therefore groundwater impacts could migrate northward toward Middlemount.

A groundwater monitoring program was proposed in the EIS, primarily to confirm the expectations of impact as estimated in the EIS. The program would include the northern area of the site as that is the direction of dip of the syncline and that is the expected area of greatest risk of off-site impacts. The EIS included commitments that the proposed monitoring program would include assessments of:

- groundwater interactions with surface waters of Cockatoo Creek
- impacts on potential shallow alluvial stygofauna
- impacts on potential groundwater dependant ecosystems across the site
- the role of the Renwan formation and groundwater storage in associated sediments.

The monitoring program was not detailed in the EIS, however a commitment was provided to install four bores at three location, three with vibrating wire piezometers and one as a stand pipe. The EIS also gave a commitment that the proponent would commence monitoring pre-mining and to continue post-mining. Details of the monitoring program will be required by EHP prior to an EA being considered for the project.

4.9 Air quality

The EIS generally addressed the air quality matters raised in the TOR, including dust and greenhouse gas emissions.

The EIS stated that the local airshed was of high quality, compromised only infrequently, especially during periods of drought, by diffuse particulates and dust haze through pastoral operations and mining on surrounding land. Existing air pollution was mostly confined to dust. Prevailing winds at the Foxleigh Mine would be predominantly moderate (4–8m/s) and from a south-east to north-east direction.

The EIS stated that the nearest sensitive receptor was a residential area on the south-eastern fringe (centenary Drive East) in Middlemount, located approximately 5.3km north-west of the project site. Three rural residential properties are located closer to the project site: Tralee Homestead, located within the project site and the nearby Lake Lindsay Residence and Foxleigh Homestead. The EIS stated that legal agreements with the owners of these three properties were being negotiated. Therefore, these residences had not been included as sensitive receptors in the EIS.

4.9.1 Dust

The EIS identified particulate matter, i.e. dust, as the main potential air pollutant. Odour may be a potential issue associated with the existing sewage treatment plant on site, however the EIS stated that no odour complaints had been received to date regarding sewage odour and consequently odour was not expected to cause any unacceptable impacts.

The major sources of particulate emissions from the project would include:

- ROM coal excavation
- overburden blasting and transfer.

Wind erosion would be expected from:

- overburden and ROM coal stockpiles
- haul roads and through road grading
- the coal handling train load out facility.

Air quality modelling was undertaken for the worst-case dust impact scenario for year 10 (2022) based on:

- mining occurring simultaneously in the Foxleigh Plains and Eagles Nest pits
- operations in the Foxleigh Plains pit occurring in the north-west corner of the project site in closest proximity to Middlemount (5.3km)
- maximum surface area of unrehabilitated (exposed) overburden.

The EIS described how air modelling conducted for the proponent showed that unmitigated concentrations of both suspended particulates (i.e. particulate matter less than 2.5 micrometres and total suspended particulates) and deposited particulates would be within the Environmental Protection (Air) Policy 2008 (EPP Air) air quality objectives (except for PM10 modelled without any mitigation measures being applied). The model predicted that unmitigated PM10 concentrations would exceed the EPP Air by approximately four per cent on two occasions in year 10. However, the EIS proposed a number of dust mitigation measures, including a Dust Control Procedure (i.e. watering of exposed surfaces and minimising the area of exposed surfaces at any one time) and concluded that those measures would prevent EPP Air exceedances in Middlemount due to the mine. The EIS committed to the proponent conducting real-time dust monitoring of PM10 over the project life and to put corrective actions in place to prevent unacceptable dust nuisance.

The EIS identified an ambient air quality objective for this project as being five exceedances per year of the 24-hour PM10 concentrations (of 50 micrograms/cubic metre) and proposed a compliance limit of the sixth-highest 24-hour PM10 concentration at nearby sensitive receptors. The department cannot accept that proposal as it is based on standards applicable to bushfires, dust storms and fuel reduction burning for fire management. The proposal was considered to be inappropriate for the project in that it could reduce the level of protection for public health to an unacceptable level. PM10 emissions would be regulated in the EA by adopting the department's standard condition which prohibits exceedances of PM10 emissions of 50 micrograms per cubic metre (24-hour average) at any sensitive or commercial receptor.

4.9.2 Greenhouse gas

The EIS described how greenhouse gas (GHG) would be generated by the project. An assessment of GHG emissions was undertaken in accordance with the National Greenhouse and Energy Reporting Act 2007 (NGER Act) for each year of the life of the project. Greenhouse gas emission rates were estimated using the National Greenhouse Accounts Factors (Department of Climate Change and Energy Efficiency 2010).

The EIS stated that 183,605 tonnes CO₂-e/year would be generated through the following sources:

- coal production fugitive emissions
- stationary combustion
- transport combustion
- additional stationary fuel consumption
- electricity.

The EIS committed to implementing the following measures for energy efficiency evaluation:

- selection of energy efficient motors
- adoption of a mining method that uses large equipment and economies of scale to significantly reduce GHG emissions
- extracting and transporting coal and overburden efficiently minimising the number of trips and fuel consumption
- recycling of refrigerants in equipment and air conditioning
- segregation of general waste into recycling materials and general waste
- minimising burning of vegetation
- development and maintenance of an inventory of emissions and sinks

- energy conservation and GHG audits with results compiled into annual progress reports.

Cumulative impacts may occur from the proposed Middlemount Coal Project, Stage 2, if both projects operated at the same time. The EIS stated that due to project locations, operational stages and proposed mitigation measures, cumulative impacts would be unlikely.

4.10 Noise and vibration

The EIS adequately addressed the noise and vibration matters raised in the TOR.

The EIS again stated that legal agreements were being negotiated with the owners of three nearby properties and that therefore, those residences had not been included as sensitive receptors in the EIS.

The EIS stated that the nearest sensitive receptor to the project site would be the residential area on the south-eastern edge of the township of Middlemount. 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.

Noise modelling including of blasting, low frequency noise and road and rail traffic concluded that all noise levels from the proposed mining operations would meet regulatory requirements. In order to minimise the impact of noise and vibration, the proponent committed to only undertake blasting during daylight hours.

Cumulative noise impacts, when assessed along with noise data and reporting from the Middlemount Coal Project was predicted to comply with regulatory requirements at all assessed sensitive receptors.

4.11 Ecology

The project site covers an area of approximately 3363ha located in the Northern Bowen Basin Province of the Brigalow Belt north Bioregion. The project site is generally flat to undulating and is traversed by the ephemeral Cockatoo Creek in the east and Roper Creek in the west. Much of the project site has been cleared in the past for grazing, however there are areas of remnant woodland vegetation remaining, particularly along Cockatoo Creek and other drainage lines. The site includes endangered Brigalow and Queensland Blue Gum regional ecosystems. There were no Category A environmentally sensitive areas identified on the site.

The project site is currently used for beef cattle grazing and is surrounded by other mining operations and pastoral properties. The site is traversed by two roads, a water pipeline, an electricity transmission line, access tracks and the approved route for the Central Queensland gas pipeline.

4.11.1 Flora

Much of the project site has been cleared previously for grazing. However, there are areas of remnant woodland vegetation remaining, particularly along Cockatoo Creek and other drainage lines. The EIS stated that the riparian vegetation along Cockatoo Creek is nearly continuous and provides habitat for fauna species and operates as a narrow fauna movement corridor. Vegetation was particularly fragmented to the south of the site.

Flora species identified on site included 168 native and 22 exotic species, of which six were declared State weeds. The identified vegetation was assessed as supporting a diverse range of vegetation communities including Brigalow, Poplar Box, Queensland Blue Gum, and Coolabah.

Vegetation communities identified on site are summarised as:

Vegetation Management status Endangered—156ha, Brigalow (*Acacia harpophylla*) dominant and co-dominant communities, including discrete areas of:

- Brigalow: RE 11.3.1 Open forest of *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains
- Brigalow: RE 11.4.8 *Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains
- Brigalow: RE 11.4.9 *Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains
- Queensland Blue Gum: RE 11.5.17 *Eucalyptus tereticornis* woodland in depressions on Cainozoic sand plains/remnant surfaces
- Brigalow: RE 11.9.5 *A. harpophylla* and *C. cristata* open forest on fine-grained sedimentary rocks.

Vegetation Management status Of Concern—69.1ha, including:

- Poplar Box: RE 11.3.2 *Eucalyptus populnea* woodland on alluvial plains

- Coolabah: RE 11.3.3 *Eucalyptus coolabah* woodland on alluvial plains
- Queensland Blue Gum: RE 11.3.4 *Eucalyptus tereticornis* and /or *Eucalyptus spp.* tall woodland on alluvial plains.

Vegetation Management status Of Least Concern—135.5ha, including:

- Queensland Blue Gum: RE 11.3.25 and 11.3.25g *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines
- Poplar Box: RE 11.5.3 *Eucalyptus populnea* and /or *Eucalyptus melanophloia spp* and /or *Corymbia clarksoniana* on Cainozoic sand plains/remnant surfaces.

Solanum elachophyllum, listed as endangered under the *Nature Conservation Act 1992* (NC Act), was found to be present in four populations across the site and assessed as being potentially present in other habitat on the site. The EIS stated that the project would not directly impact those identified species, however it would impact other areas of suitable habitat. *Cerbera dumicola*, *Desmodium macrocarpum* and *Paspalidium scabrifolium* listed as endangered under the NC Act were not identified in surveys and were all assessed as being of low likelihood of occurring on site.

The proportion of exotic species identified on site was stated as indicative of the high level of disturbance of the project site.

4.11.1.1 Potential impacts

The EIS stated that approximately 2166ha of vegetation would be cleared, including approximately 117.1ha of remnant vegetation and 79.8ha of high value regrowth (HVR) vegetation from within the project site. This represents 54.6 per cent and 54.5 per cent of the remnant and HVR vegetation within the project site, respectively.

Under the *Vegetation Management Act 1999* (VM Act) status, the project would require the removal of approximately 11.2ha of remnant Endangered vegetation, 12.3ha of remnant Of Concern vegetation and 93.6ha of remnant Least Concern vegetation within the project site.

The EIS stated that Cockatoo Creek provides a continuous vegetated corridor with substantial numbers of mature hollow bearing trees through the largely cleared, agricultural landscape. The diversion of an approximate 4km section of Cockatoo Creek and removal of all riparian vegetation would remove the habitat and cease the current fauna movement currently occurring within and beyond the project site through that corridor. The EIS stated that Cockatoo Creek is mapped in the EHP biodiversity planning assessments (BPA) mapping as a corridor of regional significance and that removal of the vegetation along Cockatoo Creek is likely to require an offset under the Biodiversity Offsets Policy as it is located within the stream protection zone and forms part of an important link in the landscape.

4.11.1.2 Mitigation

The following mitigation measures were proposed in the EIS to minimise potential impacts on vegetation within the Foxleigh Plains disturbance footprint:

- Clearing of vegetation would be undertaken in accordance with the requirements of the NC Act, including the development and implementation of a Species Management Program. The Species Management Program would outline actions to be taken to minimise impacts on animal breeding places and would be submitted to EHP for approval. The program would include prescriptions on the nature and duration of pre-clearing translocation surveys as well as measures to be employed during clearing activities such as direction of clearing, management of habitat trees, etc. The Species Management Program would also describe the role of a spotter catcher and the necessary permits for any relocation of fauna (e.g. Rehabilitation Permit or Damage Mitigation Permit).
- The EIS and draft EM plan outlined 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.
- Targeted surveys for *Solanum elachophyllum* would be undertaken within areas of potential habitat for this species prior to any disturbance occurring.
- Permits required under the NC Act in relation to disturbance of flora and fauna species would be sought from EHP prior to taking relevant actions, for example disturbance to Endangered, Vulnerable and Near Threatened protected plants.

4.11.1.3 Offsets

The EIS stated that the project would disturb approximately 11.2ha of remnant Endangered vegetation, 42.9ha of remnant Of Concern vegetation, 79.8ha of HVR Endangered vegetation and 0.8ha of HVR Of Concern vegetation. The disturbance of this vegetation would require an offset under the Queensland Biodiversity Offset Policy. The Brigalow disturbed by the project would also require offsets under the EPBC Act and the two policies align so that the disturbed Brigalow would only need to be offset once.

A biodiversity offset management plan was not provided in the EIS, although a proposed Brigalow offset area in an area on ML70171 was included as a figure in the EM plan.

4.11.2 Fauna

The EIS stated that 134 species of terrestrial vertebrate fauna were recorded at the site including six introduced species and comprising 94 species of bird, eight amphibians, 11 reptiles and 21 mammals.

The EIS stated that three NC Act Threatened and Near Threatened Fauna Species, the Little Pied Bat, Cotton Pygmy-goose and Squatter Pigeon were all present on site and that no additional fauna species listed as Threatened or Near Threatened under the NC Act were identified as potentially occurring within the project site from database searches.

Generally the extensive cleared areas of the site were stated as of low habitat value for fauna and the remaining vegetated areas of low to moderate habitat value. The greatest species diversity during the survey was recorded on Cockatoo Creek. The low activity levels of introduced species was interpreted to mean that the site contains only small populations of introduced species.

The EIS stated that the fauna assemblage recorded within the project site is typical of the central Brigalow Belt and the project site is not considered to have any particularly significant values for fauna such as high biodiversity, important feeding areas, high endemism, unusual fauna assemblages, or unique habitat types or assemblages.

4.11.2.1 Impacts

The most significant areas of fauna habitat within the project site are the vegetation that fringes Cockatoo Creek, and the Poplar Box and regrowth Brigalow woodlands scattered across the project site. The project involves the diversion of an approximate 4.5km section of Cockatoo Creek and the removal of approximately 119.5ha (or 56 per cent) of the remnant vegetation and 80.6ha of HVR vegetation. That clearing includes 50ha of the 56ha identified riparian vegetation on Cockatoo Creek. The removal of this vegetation would result in a reduction in the area of habitat available for fauna within the immediate vicinity of the project site. Fauna may also be potentially impacted indirectly through noise, vibration and lighting as well as increased levels of pest plants or animals.

Noise, vibration and habitat loss are the principal impacts of the project on fauna species. The EIS noted the potential impact of noise and vibration on fauna, however was unable to quantify the potential impacts to fauna species or the area of habitat that whilst remaining uncleared would be lost as suitable habitat due to impacts of noise, dust and operational activities.

4.11.2.2 Mitigation

The EIS proposed mitigation measures specifically for fauna including:

- Cleared vegetation would be placed in stockpiles and utilised, where practicable, for rehabilitation/remediation of disturbance areas.
- The Cockatoo Creek diversion channel would be designed following good practice design principles. These design principles would seek to replicate, as far as practicable, the natural features of a diverted waterway including channel width and sinuosity, pools and rifles in order to maximise the diversion channel's habitat values for a variety of fauna species.
- The Cockatoo Creek diversion channel and surrounds would be revegetated with native species representative of the natural vegetation types of the project site and logs from cleared vegetation should be placed within the revegetation area to provide fauna habitat.

4.11.2.3 Pest plants and animals

The EIS noted that the project may introduce and spread weed species and facilitate the establishment and expansion of existing populations of pest animals. The invasion of pest plants could degrade the quality of fauna habitats, increase pest animals such as rabbits, foxes and pigs and result in direct predation of native fauna species.

At the time of the field survey, six declared pest plants were detected within the study area as isolated individuals or small clumps and evidence of pest animals such as pig diggings and rabbit scats were small and scattered suggesting that these species are not currently present in large numbers within the study area.

4.11.3 Mitigation measures

The EIS committed to develop and implement a Pest Animal and Weed Management Plan to control pest plant and animal species in the project site and include monitoring of levels of infestation and control when required, and vehicle and plant washdown procedures.

The EIS noted the need for a Species Management Plan to be developed and implemented in accordance with the requirements of the NC Act. The Species Management Plan would be required to outline actions to be taken to minimise impacts on animal breeding places. The actions may include prescriptions on the nature and duration of pre-clearing translocation surveys as well as measures to be employed during clearing activities such as direction of clearing, leaving habitat trees overnight, clearing surrounding vegetation, nudging habitat trees prior to felling and to describe the role of a spotter catch and the necessary permits for any relocation of fauna. The Species management Plan was not provided and will be required as part of the approval of the project.

4.11.4 Aquatic ecosystems

The EIS stated that Cockatoo Creek was a third order ephemeral stream with approximately 20–70m of riparian vegetation on its banks. It was typically characterised by a dry stream bed with disconnected waterholes, rainfall would create flow and aquatic ecosystems would therefore be adapted to that wet and dry cycle. An approximately 7ha farm dam is also on site adjacent to the creek.

The site includes approximately 7.3ha of Wetland RE (RE 11.5.17—Queensland Blue Gum), 26.6km of watercourses and approximately 56ha of riparian vegetation.

A single aquatic flora and fauna survey was undertaken in October 2010 during a flow event in the ephemeral Cockatoo Creek. The water quality observed was stated as typical for a slightly to moderately disturbed lowland stream in central Queensland. Eight fish, 49 macroinvertebrate and two turtle species were recorded on the site.

The creek and dam were both noted as turtle breeding habitat under the Nature Conservation (Wildlife Management) Regulation 2006.

The EIS noted that impacts to aquatic ecosystems would occur through:

- Clearing of 50 of the 56ha of the riparian vegetation along Cockatoo Creek.
- Removal of the 7ha dam and breeding habitat for the Cotton Pygmy-goose.
- Removal of the 4km of Cockatoo Creek including the loss of aquatic fauna including fish, macroinvertebrates and turtles and the loss of their aquatic habitat and food sources.

The EIS and EM plan proposed 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, crossings and exposed soils near or adjacent to waterways.

The EIS committed to the designing of the Cockatoo Creek diversion in a way seeking to replicate the natural features of the waterway, including channel width, sinuosity, pools and riffles in order to maximise the diversions habitat values for fauna species. The design was stated that it would also include revegetating the Cockatoo Creek diversion and surrounds with native species representative of the natural vegetation on the site and placement of cleared vegetation (logs) as habitat for fauna. The design has not been developed for the EIS but a diversion design and management plan is required prior to the diversion occurring.

The EIS committed to develop and implement a REMP to monitor, identify and describe any adverse impacts to surface water, quality and flows and aquatic ecosystem values.

4.11.5 Stygofauna

Assessment of stygofauna for the site was conducted through analysis of groundwater samples taken from the Rangal coal measures and a literature review relevant for the site. The limited stygofauna assessment did not record any fauna in the samples taken from groundwater in the coal measures. DNRM requested that additional

consideration of stygofauna impacts post EIS and prior to approval of the project.

4.12 Cultural heritage

The EIS has met the TOR requirements for Indigenous and non-Indigenous cultural heritage.

4.12.1 Indigenous cultural heritage

The EIS stated that no declarations in relation to Aboriginal heritage had been made under Commonwealth legislation for the project site and no sites had been listed on Commonwealth heritage lists. The Southern Barada Barna and Kabalbara People (SBK) had been identified as affected Aboriginal parties for the project in accordance with the *Aboriginal Cultural Heritage Act 2003* (ACH Act). The EIS stated that a Cultural Heritage Management Plan (CHMP) was being developed with the SBK in accordance with the ACH Act. A commitment was given to finalise the CHMP to manage any impacts on Indigenous cultural heritage prior to any disturbance.

4.12.2 Non-Indigenous cultural heritage

A non-Indigenous historical cultural heritage assessment was undertaken for the project. The assessment included a literature review, examination of historic aerial photography and field surveys. No state or locally significant historical cultural heritage items or places are likely to be impacted by the project. The Old Barwon Yards Complex was the only historical cultural heritage site within the study area. It was assessed in the EIS as of low heritage value. The site would not be disturbed by the project and therefore would not require any mitigation measures. The EIS committed to implementing a mitigation strategy in the event that sites of historical cultural heritage significance would be identified during ground disturbance. The mitigation strategy was included in the EIS.

4.13 Matters of National Environmental Significance

4.13.1.1 Process

On 29 March 2010, the proponent referred the project to SEWPaC in accordance with the EPBC Act. On 28 May 2010, SEWPaC determined the project to be a controlled action pursuant to Section 75 of the EPBC Act to be assessed through an EIS in accordance with the bilateral agreement.

This EP Act EIS process is accredited for assessment under Part 8 of the EPBC Act in accordance with the bilateral agreement. The Commonwealth was included as an advisory body for the project and provided its comments on the draft TOR and EIS documents.

The relevant controlling provisions are Sections 18 and 18 (A) (listed threatened species and ecological communities) of the EPBC Act. The decision included that project has the potential to impact matters of national environmental significance (MNES) as it involves the clearing of up to 2276 ha of suitable habitat for the nationally threatened Squatter Pigeon (*Geophaps scripta scripta*).

4.13.1.2 Site

The EIS stated that the project site is generally flat to undulating and is traversed by the ephemeral Cockatoo Creek in the east and Roper Creek in the west. Much of the site is cleared however there are areas of remnant vegetation especially along Cockatoo Creek and drainage lines.

The EIS reported on MNES, based on desktop studies, field surveys for flora and fauna and geological and topological information.

A single late wet season flora and fauna survey was conducted in May 2011, the results of which were combined with earlier fauna surveys (May 2009, January and May 2010) and the desktop data review. A single aquatic flora and fauna survey was conducted in October 2010.

4.13.1.3 Fauna

Thirteen threatened fauna species were listed as potentially occurring on site. Of those, the Squatter Pigeon was present, Ornamental Snake assessed as highly likely but not found and the Australian Painted Snipe and Brigalow Scaly-foot assessed as moderately likely but not found.

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 (MNES), as the project site contains:

- 148.7ha of an endangered ecological community (EEC) listed under the EPBC Act, namely brigalow (*Acacia harpophylla*) dominant and co-dominant communities. The total area of Brigalow was comprised of individual areas ranging from 1 ha to over 20ha of four discrete regional ecosystems: RE 11.3.1 Open forest of *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains; RE 11.4.8 *Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains; RE 11.4.9 *Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains; and RE 11.9.5 *A. harpophylla* and *C. cristata* open forest on fine-grained sedimentary rocks.
- Species listed under the EPBC Act as vulnerable including:
 - squatter pigeon (southern) (*Geophaps scripta scripta*) known to occur within project site
 - The Ornamental Snake was highly likely to occur on site
 - Australian Painted Snipe and Brigalow Scaly-foot were likely to occur on site
 - The Red Goshawk, Star Finch, Northern Quoll, Greater Long Eared Bat, Collared Delma, Yaka Skink, Dunmall's Snake, Retro Slider and Fitzroy Turtle were stated as potentially occurring but with a moderate or low likelihood.

4.13.1.4 Migratory species

Two migratory species were found on site, the Great Egret and the Rainbow Bee-eater.

Two migratory species were assessed as highly likely to occur on site: the White-throated Needletail and Fork-tailed Swift.

Eight migratory species were assessed as moderately to low likelihood to occur on site: Cattle Egret, Latham's Snipe; Magpie Goose; Painted Snipe; White-bellied Sea-eagle; Barn Swallow; Black-faced Monarch; and Satin Flycatcher.

4.13.1.5 Potential impacts

The EIS included a MNES impact assessment report that assessed the potential impacts to MNES by the project under the SEWPaC Significant Impact Guidelines.

The assessment concluded that:

- The project could result in a significant impact to the Brigalow TEC; as approximately 83.7ha of the 148.7ha on site would be cleared.
- No threatened flora species were likely to occur in the footprint.
- That whilst 119.5ha of remnant vegetation and 80.6ha of regrowth will be cleared, the Squatter Pigeon is not expected to be adversely impacted due to its utilisation of disturbed areas for feeding and that significant offsite areas of its habitat in the region remain undisturbed.
- The habitat for listed species potentially occurring on site was to be cleared however the impacts to the species were assessed as not significant due to:
 - the occurrences were not anticipated to represent an important population
 - the site did not represent critical habitat for the species
 - the project related clearing would not significantly impact the availability or quality of the remaining habitat to the extent the species would decline
 - the habitat disturbance was not anticipated to result in long term disruption, fragmentation or reduction of any populations that may be present.
- There would not be a significant impact on migratory species because whilst habitat would be cleared on site, the project area did not support significant breeding or feeding grounds for those species.

SEWPaC reviewed the EIS and noted that an offset management plan for MNES had not been included. However, the EIS did contain a commitment to provide an offset management plan outline prior to a decision being made about the project under the EPBC. SEWPaC has advised that the plan will be required before any decision about the project can be made under the EPBC Act. The provision of an offset management plan for MNES remains an outstanding matter.

SEWPaC referred the EIS and the draft supplementary EIS to the Independent Expert Scientific Committee on

Coal Seam Gas and Large Coal Mining Development (the committee) for its April 2013 meeting. The committee provided advice on a range of matters largely related to groundwater modelling and predictions, the design of the Cockatoo Creek diversion channel, riparian habitats, water quality and impacts on listed threatened species and ecological communities (particularly Brigalow listed ecological community) both within the project site and downstream. On 29 April 2013, the proponent was asked to address the committee's advice however, to date the proponent has not provided an adequate response.

4.14 Social

The EIS has generally addressed the TOR requirements for social issues, however has not sufficiently addressed Indigenous and mine closure aspects or cumulative impacts.

4.14.1 Area of impact

The EIS stated that social impacts would be predominantly felt in the town of Middlemount, as it is located only 5.3km from the project site. Middlemount has a large proportion of non-resident workers, mainly mine workers, who permanently reside outside of Middlemount and undertake their jobs on a fly-in fly-out (FIDO) drive in-drive-out (DIDO) basis. Many of these non-resident workers are accommodated in large scale housing villages located on the perimeter of Middlemount servicing local mines. The project would result in both positive and negative impacts as further explained in the sections below.

4.14.2 Project workforce

242 persons are currently working at the Foxleigh Mine, 40 additional persons would be required on a temporary basis during the establishment phase and 90 additional persons would be required during operations. The EIS expected the majority of workers to FIDO or DIDO mostly from coastal cities like Rockhampton or Mackay.

4.14.3 Housing and accommodation

The EIS stated that the project workforce would be housed in existing accommodation villages in Middlemount and in housing provided predominantly by Anglo American. It stated that the community had expressed its concerns at the population increase associated with this project as Middlemount would increasingly become a 'contractor town' rather than a 'family town'.

The EIS acknowledged the limited availability of housing in Middlemount and the associated lack of housing choice for potential mine employees as a limiting factor to support a more permanent population of Middlemount. Limited population growth would, in turn, impact the sustainability of the community. However, the local housing market would not be impacted because all workers could be housed in accommodation villages.

4.14.4 Social infrastructure and accessibility

The EIS identified that community, recreational, retail and health facilities were available in Middlemount at a scale consistent with the size of the town. However, Middlemount would generally experience high staff turnovers at some of these facilities and struggle to provide a consistent service to the community. In particular, child care providers, child health and family support service providers are currently unable to meet demands in Middlemount. There is growing demand for a range of support services, particularly mental health services. The EIS concluded that the Middlemount community did not currently have the capacity to respond to the impacts associated with growth in the non-resident worker population.

4.14.5 Social order and community safety

The EIS stated that social order and community safety were identified as important values within the community. Feedback during consultation indicated that residents perceived Middlemount to be a relatively safe place to live, with low crime and vandalism rates. This was confirmed during an interview with Queensland Police Service (QPS) representatives in Middlemount.

A number of stakeholders interviewed for the EIS raised concerns in relation to driver fatigue and potential implications for safety both within Middlemount and on the regional road network.

QPS indicated that traffic infringements (largely speeding and drink driving) were the most common recorded incidents in the local area. Incidents associated with antisocial behaviour (drunk and disorderly) did not have a particularly high police response rate. QPS also indicated that whilst QPS response rates to domestic violence incidents in Middlemount were low this did not mean the issue was not significant in the community.

The EIS stated that there is growing concern in the Middlemount community regarding alcohol consumption.

QPS stated in its submission that additional funding from the proponent would be desirable as QPS would have to increase its police force to be able to maintain social order and community safety.

4.14.6 Community and lifestyle

The EIS stated that Middlemount had a range of sporting facilities, restaurants and cafés. The EIS consultation identified a number of key annual community events in the town (e.g. Anzac Day Ceremony). In response to the 2007 Capcoal Community Outlook Survey conducted as part of the SEAT study for the 2007–08 Capcoal CEP, 52 per cent of Middlemount residents generally gave a positive account of community life in Middlemount. Twenty per cent made comments about the lack of community connectedness (e.g. loss of family unit, impact of the transient population), 23 per cent disliked the lack of services and retail choices and 22 per cent said there were too many mining villages and the community lacked permanent housing.

4.14.7 Mine closure

The project would have a life of approximately 15 years. The EIS stated that the closure of the mine may have the following impacts:

- loss of economic stimulus through a loss of procurement opportunities for local and regional businesses
- loss of investment in local and regional education and training initiatives
- decrease in demand for accommodation in Middlemount following mine closure leading to lower house prices and higher property vacancy rates
- departure of permanent residents from Middlemount, with corresponding reduced demand for service provision
- loss of services.

The EIS committed to managing these impacts, however did not provide further details of how these impacts would be managed. The EIS provided a number of mitigation measures to address the identified impacts. A social impact management plan (SIMP) was included with the EIS. DSDIP has requested some changes to that plan including about mine closure, housing and subsidisation of health services. The SIMP contained a range of commitments and proposed government partnerships designed to both mitigate the social impacts caused by the project and to enhance the liveability of the local and regional communities. Areas of particular emphasis within the SIMP include housing availability and affordability, community services, employment and economic development.

DATSIMA stated that the EIS had not proposed mitigation measures or offsets to address training, education and employment opportunities for Indigenous people, and as such does not sufficiently address the TOR requirements for Indigenous people.

The EIS committed to developing an Indigenous People's Participation Plan in the future, in consultation with Indigenous people. DATSIMA does not support this approach as it is a TOR requirement to support this plan as part of the EIS and not to defer it into the future.

4.15 Economy

The EIS did not adequately address the economic impact matters raised in the TOR.

Traditionally the economic base of the region is supported by agricultural activities such as beef production. More recently the economy of the region has been influenced by coal mining followed by the construction industry.

The EIS stated that the economy of the Isaac Regional Council (IRC) local government area (LGA) is based on mining activity, followed by construction and agricultural activities. The IRC LGA is therefore sensitive to economic impacts from the resources sector. Employment in Middlemount is concentrated in mining, mine services, retail trade and accommodation sectors. Mining employees make up the majority of the town's permanent resident population.

The current land use at the Foxleigh Mine site is coal mining and low intensity cattle grazing. While, some of the land could be rehabilitated for a mix of cattle grazing and some small area will be planted with trees and shrubs (not quantified), the expansion of the Foxleigh Mine will result in the permanent alienation of some land from the pre-mining land use. For example, unsuitable steep slopes of final landforms (out-of-pit spoil dumps), the three final voids, the constructed diversion channel and flood protection levees would remain at the end of the mine operations. These structures will be unsuitable for agricultural or pastoral activities. The EIS did not estimate the size, total area and final depth of the residual voids at the end of mine life. This EIS stated that the elevated landforms and final voids will impact substantially on post mine land capability, but did not quantify what that might

be.

The EIS did not estimate the capacity of grazing land that would be reduced post mining nor the opportunity cost of the lost cattle grazing over the life of the mine and post mining. The EIS did not assess or estimate the value of lost ecosystem services for the remnant and riparian vegetation to be cleared for the project. Therefore the EIS did not provide a net projected opportunity cost of the project.

The EIS assessed that there would be a positive economic impact to the local, regional, state and national economies. However the EIS stated that some level of caution needs to be attached to its estimates, particularly those relating to employment impacts.

At a local level the town of Middlemount would be most affected by the project. The EIS reported that the IRC area would receive a direct increase in the demand for employees, local services and supplies, whilst noting that most employees would:

- commute from the regional centre of Mackay to the local area
- reside in temporary accommodation (65 per cent) for the duration of their shifts and 35 per cent would be housed in Middlemount.

Some negative impacts would include an increased cost of living for local and regional residents, felt mainly by families not employed in the mining industry and a reinforcement of the region's specialisation in the mining sector.

The value of the coal resource to be mined is subject to the exchange rate and coal price fluctuations. The royalty payment to the State was estimated in the EIS as \$26–\$31 million per year. The EIS estimated that the project would employ an additional 90 additional workers in addition to the 242 existing employees.

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.

4.16 Health and safety

The TOR requirements for health and safety have generally been met. They include consideration of blasting, dangerous goods/hazardous materials and catastrophic climatic events such as flooding, landslides and bushfires.

The EIS identified the following community values to be at risk:

- safety in relation to impacts that could affect public spaces or private property
- amenity
- continuity of services (including emergency services)
- clean air and water.

Amenity, clean air and water have been addressed in previous chapters in this report.

The EIS stated that sensitive receptors would be mainly associated with surrounding land uses such as grazing, mining and residences/commercial activities in Middlemount. The EIS stated that health and safety issues would be addressed in an updated Safety and Health Management System (SHMS) prior to the commencement of the project. The SHMS was not included in the EIS however, a commitment was provided that it would be based on the existing Foxleigh Mine SHMS and address the construction, operations and decommissioning phases of the project.

The EIS committed that the SHMS would:

- meet the requirements of the *Coal Mining Safety and Health Act 1999* and Regulation, AS/NZS4801–2001 and ISO14001:2004
- align and comply with existing corporate standards and be comparable to systems used at other open cut mining operations within the company (e.g. German Creek Mine)
- integrate site emergency response with the emergency services response
- include an operational hazard analysis, regular hazard audits, fire safety, emergency response plans, qualitative risk assessment and construction safety.

The EIS committed to adopting the Principle Hazard Management Plans (PHMP) currently implemented at Foxleigh Mine to manage and mitigate impacts on health and safety. PHMPs would create the framework for addressing the requirements of a high level Integrated Risk Management Plan (IRMP) for the project.

The EIS provided numerous controls to manage and mitigate identified health and safety issues.

4.17 Hazard and risk

The TOR requirements for hazard and risk have been met.

The EIS included a preliminary hazard assessment (PHA) in accordance with the TOR to identify, manage and mitigate any catastrophic events that may have serious off-site impacts on surrounding land use such as mining, grazing, farming, roads and the town of Middlemount. The EIS committed to undertaking a final appraisal prior to any works commencing.

Risks that need to be controlled have been identified for the following events:

- transport, storage and use of hazardous materials/dangerous goods
- storage of mine-affected/contaminated water
- floods and bushfires
- vehicle impact on infrastructure
- vandalism and sabotage.

In the worst case, the above events may result in explosions and/or contaminant releases to land, air and water. The highest risks were identified as loss of containment and combustion of dangerous goods. These events were assessed to be of moderate consequences and a low likelihood of occurrence, resulting in a medium risk.

The EIS stated that production rates would increase, resulting in greater vehicle movements and increased consumption of some hazardous materials, however the potential risks associated with would be largely confined to the project site and a safe operating distance from sensitive human receptors.

Potential risk sources that may impact on the project include neighbouring mine sites and commercial/industrial premises in Middlemount. The hazardous materials storage area and the hazardous materials transport route would be located at a safe distance from external sources of high risk.

The EIS concluded that the overall risk profile for the project was low due to proposed controls and no significant cumulative risks were identified.

The EIS committed to updating the existing Foxleigh Mine Major Emergency Incident Plan (MEIP) and any other management plans prior to operations commencing. The EIS committed to liaising with Queensland government authorities to coordinate, manage and respond to incidents where required.

4.18 Rehabilitation

The EIS stated that rehabilitation of the project would be integrated into the existing Foxleigh mine rehabilitation program. The EIS proposed progressive rehabilitation that would include stripping of useable topsoil in advance of mining, progressive construction of final landform profiles and topsoiling and revegetation of reshaped emplacement areas.

The EIS stated that the rehabilitation objectives are to:

- Ensure that post-mining landforms are safe, stable, non-polluting, self-sustaining for final use and require minimal maintenance.
- Return the majority of disturbed land to an appropriate Land Capability/Suitability Classification Class.
- Make disturbed areas geotechnically and erosionally stable to ensure that the proposed subsequent land use is not compromised by surface instability.

The EM plan outlined the principal aspects that should be considered in rehabilitation, such as:

- landform design
- rehabilitation methods
- topsoil management
- revegetation and rehabilitation monitoring and success.

The EIS stated that the following areas on the project site would be rehabilitated: overburden emplacement areas; mine access and haul roads; MIA; final voids; ROM stockpiles; and water management infrastructure. CHPP and tailings storage facilities on the Foxleigh mine site would also be impacted by the project and so will also require rehabilitation as part of the proposed expansion. The EIS committed to rehabilitation of pit diversion and flood protection levees as part of their construction and implementation rather than leaving their revegetation and

stabilisation to a later time.

Soil types and land suitability and agricultural land class were assessed as part of the rehabilitation planning. The EIS stated that there is more than 6 million m³ of topsoil available on site for use in rehabilitation. Topsoil placement would be to a minimum of 15cm in rehabilitated areas, on that basis approximately 3 million m³ of top soil is required for the modelled rehabilitation.

Topsoil management proposed includes immediate use where possible, otherwise stockpiling to a maximum thickness of 4m to maintain soil quality. The application of dust suppression water during topsoil management is proposed, however there is no indication in the EIS of the impact of the likely highly saline water on rehabilitation success.

Sampling of overburden and coal reject materials was conducted on samples taken from either the proposed site or on samples from the adjacent mine and assessed to determine a range of factors influencing their rehabilitation potential and management needs for example, the risk of acid generation and solubility of metals. The EIS concluded that the risk of acid and saline runoff from overburden was low and would diminish further over time. Metal contents were below soil criteria and stated as not likely to present any rehabilitation or environmental issues.

However, the EIS noted that overburden has lower organic content, poorer nutrient status, poorer structure and other properties adverse to vegetation growth and concluded that the final landform will have an altered (reduced) capacity to support the original vegetation.

Slope angles and lengths will be increased and this will result in an increased risk of soil erosion. Soil profiles and geotechnical stratigraphy will be altered resulting in lower quality material in the plant root zones. The EIS stated that overburden material would therefore require specific management to deliver rehabilitation outcomes. The EIS stated that similar strategies to those currently applied on the existing mine would be applied to this project. For example overburden emplacement would require slope management to manage erosion and topsoil cover would be inclusive of grassed pasture and fertiliser and soil treatment as required.

Coal reject materials were similarly assessed and expected to be low acid and low metal generating, however rejects would generate excess sulphate and salinity in runoff. Rehabilitation of tailings and rejects would require capping and finally topsoil dressing. There was no mention in the EIS of the success or practicality of this approach to presumably very moist and fine materials that may not dry or consolidate for extended periods of time. Coarse rejects were stated as being suitable for mixing with overburden and application in overburden emplacement and rehabilitation.

The EIS noted that the post-mining landscape would change with the inclusion of the elevated landforms and the three final voids. The preferred use of final voids was not specified and consequently the EIS did not identify conclusive management strategies for final void rehabilitation nor specify water quality objectives and drainage strategies. The EIS did commit to preparing a final void report to resolve those matters.

Rehabilitation acceptance criteria were outlined in the EM plan, however the detail required in a rehabilitation plan was not complete. The EIS committed to the development of a Rehabilitation Management Plan including a schedule of works and success criteria according to the Departmental guidelines. The EIS indicated that the majority of the proposed actions and strategies would mirror those currently applied on the Foxleigh Mine site.

Decommissioning strategies were not detailed in the EIS but stated as following those for the existing Foxleigh mine. Those include demonstration of achieving site rehabilitation success criteria, bunding and fencing of high wall and end walls of final voids for safety purposes, reprofiling voids and ramps to be geotechnically stable, removal of infrastructure and reseeding MIA areas except where infrastructure deliberately remains for future land owners (for example roads).

4.18.1 Potential impacts

Land suitability across the site would be degraded post closure despite the proposed rehabilitation. The EIS identified the existing land suitability includes grazing and that the area is generally unsuitable for broadacre rainfed cropping. The site was assessed as having 1354ha of good quality agricultural land (Class C). Post mining the areas of GQAL would be reduced by 430ha. The EIS stated that the majority of those impacted areas would remain suitable for grazing post rehabilitation. The EIS also stated that, after rehabilitation, land suitability generally would be degraded compared to pre mining case, but that the rehabilitated site would support grazing apart from areas such as final voids, diversions, levees, and landform slopes that would be unsuitable pastoral activities. However as the landform slopes would be likely to create a barrier to stock movement, it would be unlikely that grazing would occur across much of the site despite the land suitability. However the EIS did not address that issue.

4.18.2 Monitoring

A rehabilitation monitoring program was committed to in the EIS but was not provided. The EIS committed that monitoring of rehabilitation would occur and that maintenance activities including: ripping and reseeded to ensure germination success; and maintenance and augmentation of drainage and erosion control works would be conducted as required.

The EIS stated that the program would be based on the existing rehabilitation monitoring program underway at the original mine site and that the existing monitoring program is based on the then Department of Minerals and Energy Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995). The program focuses on vegetation ground cover, foliage projective cover, visible indicators of erosion and vegetation recruitment, rehabilitation reference sites will be used to develop success criteria and that monitoring will be undertaken to confirm the long term stability of final landforms.

5 Adequacy of the environmental management plan

An outline of the environmental management plan (EM plan) for the project was provided with the EIS and upgraded on two occasions with supplementary information during the EIS assessment process. The EM plan included the expected range of information on the proposal including:

- the operational aspects and rehabilitation proposed
- consultation
- notifiable activities
- approvals
- environmental values of the site
- potential impacts
- management strategies
- proposed conditions.

The EM plan was proposed for the combined operation of the existing mine and the proposed expansion (this project), it was based primarily on the EM plan prepared for the existing operation. The EM plan outline, in conjunction with the EIS main reports, did provide sufficient information to describe the impacts of the proposal and the means of managing and minimising those impacts and was therefore suitable for this EIS process.

Many of the outstanding matters identified in this report are focused on resolving aspects of the EM plan, consequently the EM plan will require significant improvement before it is suitable and before a decision could be made to grant an EA for the project. Guidance on the content of an EM plan is available at section 203 of the EP Act and in departmental guidelines.

For example reviewers identified the need to revise the EM plan to make it measurable, enforceable and auditable in line with current EHP expectations and regulatory strategy and many of the conditions proposed in the EM plan were not suitable for direct application to the EA, for example in relation to dust. More discussion around conditioning of the project is provided in Chapter 7.

6 Outstanding matters

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.

The EIS identified specific actions that were required to ensure the project was suitable to proceed however, in many cases it did not provide the identified action/information rather deferred that by committing to provide it post EIS as part of the project approvals (for example EA application process). Details of those commitments or requirements are provided in the preceding chapters of this report.

This report therefore recommends that the following outstanding matters be addressed prior to decisions being made about granting an EA for the project.

6.1 Sensitive receptors

There are three isolated rural residential properties in proximity to the project site, the Tralee Homestead, Lake Lindsay Residence and the Foxleigh Homestead. The Tralee Homestead is located within the project site. The EIS stated in numerous sections that legal agreements were currently being negotiated with the owners of these three properties. These residences were therefore not considered to be sensitive receptors and were not discussed further in the EIS. The potential for these properties to be influenced by noise and vibration, dust, lighting, groundwater, surface water and other impacts has therefore not been assessed. The resolution of the arrangements for these receptors and if necessary potential impact assessments must be finalised prior to any approvals being granted.

6.2 Flood levees and diversion of Cockatoo Creek

There was a commitment in the EIS that prior to construction the following would be completed prior to a water diversion licence application:

- redefining of flood protection levels per EHP hazard categories
- detailed design of the levees
- development of design, construction, operational and decommissioning plans
- detailed revegetation and stabilisation plans for levees
- develop a diversion monitoring program to address all stages from pre mining until post closure to confirm that the diversion is operating as a waterway in equilibrium and not impacting adjoining reaches.

6.3 Final voids

The preferred use of the three final voids was not specified and consequently the EIS does not identify conclusive management strategies for final void rehabilitation nor specify water quality objectives and drainage strategies. The EIS did commit to preparing a final void report to resolve those matters. That final void report should be provided as part of the EA application process.

6.4 Containment systems

The proposed conditions in the EM plan indicated that the hazard categories, design storage allowance and mandatory reporting levels for the proposed containment systems/dams are not yet determined. That level of detail will be required as part of the EA application process.

6.5 Soils

The EIS did not suitably address the requirements for soils in the TOR. A number of matters such as soil testing and mapping intensity and soil properties such as plant available water capacity (PAWC) were not fully resolved during the EIS. However the EIS included a commitment to complete the agreed scope of works, analysis and interpretation and to appropriately manage all soils encountered on the site if the operation proceeds.

There is a need to develop full site soils information including completion of sampling and mapping, developing the topsoil management plan and recalculation of PAWC in conjunction with DNRM and EHP. That should be

completed as part of the EA application process.

6.6 Visual amenity

The EIS commits to rehabilitation of post mine landforms that will soften the landforms and ensure that they will not form conspicuous features and a range of mitigation measures were proposed including limiting vegetation clearing, lighting design, selection of colours for infrastructure and progressive rehabilitation. Those commitments should be formalised into the EM plan as part of the EA application process.

6.7 Stock route

The EIS stated that the stock route (U408) that traverses the site will be managed to remain in operation across part of the mining lease and that an agreement will be established to manage that. No detail about that agreement was provided in the EIS. That commitment should be formalised in conjunction with DNRM and IRC as part of the EA application process.

6.8 Rail

QR National/Aurizon has requested ongoing consultation on dust control, particularly at the rail load out facility and potential impacts of increased train movements on the rail system.

6.9 Waste

The EM plan should set out a clear management regime for the disposal of potentially sodic overburden.

The proponent has committed to managing waste, including regulated waste, generated by the project in accordance with the waste management hierarchy (i.e. avoidance, reuse, recycling and disposal) and in accordance with relevant legislation including the Queensland Environmental Protection (Waste Management) Policy 2000 (EPP Waste). However the EIS did not provide a Waste Management Plan (WMP) for the project nor a clear commitment to developing and implementing a WMP incorporating 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 WMP should be provided as part of the EA application process.

6.10 Water

The hazard categories, design storage allowance and mandatory reporting levels are not yet determined for the range of water storages proposed. That level of detail will be required at the EA application stage to finalise the EM plan.

An additional external allocation of 700MLpa raw water is stated as necessary for the project. The source of that water has not been confirmed, therefore resolving a suitable water supply and addressing any potential impacts of that supply should be resolved as part of the EA application process.

6.10.1.1 Groundwater

A groundwater monitoring program was proposed in the EIS primarily to confirm the expectations of impact as estimated in the EIS.

The program would take into account that the northern area of the site has the greatest risk of off-site impacts and include:

- assessments of groundwater interactions with surface waters of Cockatoo Creek
- impacts on potential shallow alluvial stygofauna and potential groundwater dependant ecosystems across the site
- monitor the role of the Renwan formation and groundwater storage in associated sediments.

The commitment includes to commence monitoring pre mining and to continue post mining. Details of the program will be required as part of the EA application process.

6.10.1.2 Water monitoring

A commitment is made in the EIS to develop a REMP and a Water Management Plan to demonstrate how operational management of water and potential contamination will be conducted and reviewed. These actions should be completed for the project as part of the EA application process.

6.11 Air

EIS proposed a number of dust mitigation measures, including a Dust Control Procedure, watering of exposed surfaces and minimising the area of exposed surfaces at any one time which would prevent any PM10 exceedances in Middlemount. The EIS committed to real-time dust monitoring of PM10 over the project life to put corrective actions in place to prevent dust nuisance. Those commitments should be detailed in the EA application process and any dust matters involving rail should include engagement with Aurizon.

6.12 Flora

THE EIS made a range of commitments relating to management of impacts to flora the identified outstanding action include to develop:

- a Pest Animal and Weed Management Plan
- offset management plan
- rehabilitation management plan.

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. The Species Management Plans will, where relevant, outline:
 - actions to be taken to minimise impacts on animal breeding places including prescriptions on the nature and duration of pre-clearing translocation surveys
 - measures to be employed during clearing activities such as direction of clearing, management of habitat trees, etc.
 - describe the role of a spotter catcher and the necessary permits for any relocation of fauna (e.g. Rehabilitation Permit or Damage Mitigation Permit).
- Offset programs, including for the approximately 11.2ha of remnant Endangered vegetation, 42.9ha of remnant Of Concern vegetation, 79.8ha of HVR Endangered vegetation and 0.8ha of HVR Of Concern vegetation.
- An outline of 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
- A program of targeted surveys for *Solanum elaeagnifolium* to be undertaken within areas of its potential habitat prior to any disturbance occurring.

Those outstanding actions for flora should be completed as part of the EA application process.

6.13 Aquatic ecosystems

The EIS committed to the designing of the Cockatoo Creek diversion seeking to replicate the natural features and characteristics of the waterway including channel width, sinuosity, pools and riffles in order to maximise the diversions habitat values for fauna species. The design was stated to also include revegetating the Cockatoo Creek diversion and surrounds with native species representative of the natural vegetation on the site and placement of cleared vegetation (logs) as habitat for fauna. That design has not been developed for the EIS but a diversion design and management plan is therefore required prior to the action occurring.

The EIS committed to developing and implementing a receiving environment monitoring program (REMP) to monitor, identify and describe any adverse impacts to surface water, quality and flows and aquatic ecosystem values. However, that REMP was not provided with the EIS and is therefore required as part of the EA application process.

6.13.1.1 Stygofauna

The DNRM has requested additional consideration of stygofauna impacts post EIS and pre approval of the project. Those requirements should be confirmed with DNRM and addressed as part of the EA application process.

6.14 Cultural heritage

The EIS stated that a Cultural Heritage Management Plan (CHMP) was being developed to manage any impacts on Indigenous cultural heritage. The CHMP should be finalised as part of the EA application process.

6.15 Socio-economic

DATSIMA has requested that an Indigenous People's Participation Plan be provided. Changes to the SIMP should be further discussed with DSDIP.

6.16 Health and safety

The EIS made a commitment that a Safety and Health Management System (SHMS) and Principle Hazard Management Plans (PHMP) would be provided prior to the commencement of the project. They would address the construction, operation and decommissioning phases of the project and include an operational hazard analysis, regular hazard audits, fire safety, emergency response plans, qualitative risk assessment and construction safety.

Those should be completed as part of the EA application process.

6.17 Hazard and risk

The EIS committed to updating the existing Foxleigh Mine Major Emergency Incident Plan (MEIP) and any other management plans prior to operations commencing and to liaise with Queensland government authorities to coordinate, manage and respond to incidents where required. Details of the updated program and response arrangements should be provided as part of the EA application process.

6.18 Decommissioning and rehabilitation

Decommissioning strategies and a rehabilitation program were not detailed in the EIS.

The EIS committed to rehabilitation that would soften the landforms and ensure that they would not form conspicuous features and that monitoring of rehabilitation would occur and that maintenance activities including: ripping and reseedling to ensure germination success; and maintenance and augmentation of drainage and erosion control works would be conducted as required. The EIS stated that the rehabilitation program would be based on the program underway at the original mine site and would focus on vegetation ground cover, foliage projective cover, visible indicators of erosion and vegetation recruitment, that rehabilitation reference sites will be used to develop success criteria and that monitoring will be undertaken to confirm the long-term stability of final landforms.

Those rehabilitation and decommissioning management plans should be provided as part of the EA application process.

7 Recommended conditions of approval

Throughout this EIS process 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, for example through conditions of approval, to achieve acceptable environmental outcomes. In the absence of detail about a particular matter the EIS has made certain commitments to achieve suitable outcomes. A significant amount of additional information is required for those commitments to be converted into measureable and auditable conditions. This report has made note of the range of commitments and they are listed above. The draft EM plan also included a range of proposed conditions, some of those conditions appeared suitable, others were not and some were incomplete.

To suitably implement the project and as required under section 59 of the EP Act, this report includes a set of recommended conditions for approval at Annexure B.

7.1 Environmental Protection Act 1994

EHP recently released its Regulatory Strategy that changes the way that projects such as this will be managed and conditioned. The strategy recognises that:

- EHP's role is to set the limits on what an approval holder can do
- business and industry are best-placed to work out how to stay within those limits
- the responsibility for managing the risk from an activity sits with the person carrying out the activity, rather than with EHP.

So rather than responding directly to each of the proposed conditions within the EMP, noting that they were in a form established prior to the regulatory strategy being released and that future conditioning will be significantly different; the recommended conditions proposed here (Annexure B) are the range of relevant approved standard conditions under the regulatory strategy including the model mining conditions and standard conditions for containment systems (e.g. dams and levees).

Due to the lack of suitably detailed information in the EIS the conditions have been provided generically as recommendations in order to provide guidance about the departments change in approach to conditioning and to provide specific examples of the type of conditions that would be applied once the level of available information is improved.

This project will require an amendment of the existing EA for the Foxleigh Mine, it is intended here that, where suitable, the conditions of the existing operation are also amended to reflect these model mining conditions. The conditions are not considered complete nor finalised and are provided for consideration when deciding to grant an EA with 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 Water Act 2000

A number of separate water licences under the *Water Act 2000* would be required for the project, for example relating to the construction of the Cockatoo Creek diversion and flood protection levees.

The EIS provided insufficient detail about the engineering designs, rehabilitation and monitoring for the diversion and levees for this EIS assessment report to be able to include recommended conditions for those water licences. Conditions for these activities will need to be decided (should they be approved) when the proponent lodges water licence applications with DNRM after this EIS process is completed.

7.3 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.

For loss of ecological values, any offsets proposal, including any species management plans should be developed in accordance with the Queensland Government's Environmental Offset Policy 2008.

8 Suitability of the project

The department has considered the TOR, the submitted EIS, all properly made submissions and the standard criteria. The project is assessed here as being suitable, on the condition that the EM plan is refined and completed in the manner directed in this report and that the subsequent environmental authority, if granted, is 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

2 July 2013

Signature

Lindsay Delzoppo

Director, Statewide Environmental Assessments

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Date

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Annexure A

Queensland Government name changes

New department (as of 3 April 2012)	Previous department(s)/amalgamations
Department of State Development, Infrastructure and Planning	Department of Employment, Economic Development and Innovation
Queensland Treasury and Trade	Treasury Department/ Department of Employment, Economic Development and Innovation
Department of Science, Information Technology, Innovation and the Arts;	Department of Employment, Economic Development and Innovation/Department of Public Works
Department of Natural Resources and Mines	Department of Employment, Economic Development and Innovation/ Department of Environment and Resource Management
Department of Agriculture, Fisheries and Forestry	Department of Employment, Economic Development and Innovation/ Department of Environment and Resource Management
Department of Environment and Heritage Protection	Department of Environment and Resource Management
Department of National Parks, Recreation, Sport and Racing	Department of Environment and Resource Management
Queensland Police Service	Department of Police
Department of Education, Training and Employment	Department of Education and Training
Department of Housing and Public Works	Department of Communities
Department of Local Government	Department of Local Government and Planning
Department of Communities, Child Safety and Disability Services	Department of Communities

Annexure B

This Annexure is comprised of two parts that should be inserted completely:

1. Model mining conditions per the Departmental Guideline - Model Mining Conditions (130626 EM944 Version 4).
2. Containment and levee conditions per the Departmental Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities (130331 EM634 Version 3).

Guideline

Mining

Model mining conditions

The purpose of this guideline is to provide a set of model conditions to form general environmental protection commitments given for mining activities, and environmental authority conditions for resource activities - mining activities imposed by the administering authority under the Environmental Protection Act 1994.

Introduction

The *Environmental Protection Act 1994* (EP Act) provides for the granting of environmental authorities for resource activities - mining activities.

In giving approval under the EP Act, the administering authority must address the regulatory requirements set out in the Environmental Protection Regulation 2008 and the standard criteria contained in the EP Act. The administering authority will give consideration to these regulatory requirements in the context of specific information about the environmental impacts of a particular project provided through an environmental impact statement or application documents.

The following model conditions may be used as a basis for proposing environmental protection commitments in the application documents. They may also be used to expedite the process of developing appropriate conditions for an environmental authority for a mining project in consultation with the administering authority.

The model conditions can be modified to suit the specific circumstances of a mining project subject to the assessment criteria outlined above. In such circumstances, variants of these conditions and/or different conditions may be applied at the discretion of the administering authority delegate and in consultation with the applicant. It is unlikely the administering authority will accept less rigorous environmental protection commitments or environmental authority conditions without clear evidence that the risk of the particular type of environmental harm addressed by those model conditions is otherwise addressed to at least the same extent by:

- a) the specific environmental management practices to be implemented
- b) technologies to be used; or
- c) the nature of the environmental values impacted by the project.

To meet the test of 'necessary or desirable' it is considered that a condition will meet this test if a demonstrable link exists to achieving the object of the EP Act. It is considered that conditions relating to monitoring and reporting under the issued authority allow the administering authority to assess the accuracy of information and assumptions made in the application and allow the detection of any trend toward environmental harm resulting from the activity.

The conditions in this guideline do not cover all the conditions necessary for regulating a resource activity - mining activity. Officers should also refer to the separate guidelines: *Structures which are dams or levees constructed as part of environmentally relevant activities* (EM634). The water schedule has been based on the model water conditions for coal mines in the Fitzroy basin. As a result the surface water schedule conditions may not be applicable to other catchments or to other types of mines. The water schedule may also be subject to change as a result of the Isaac River mine water release pilot.

How to use this guideline

New project applications

The model conditions should be applied to all new mining project applications lodged after the guideline is approved.

Applications for new projects in progress

For applications in progress on the date this guideline is approved, the applicant should be advised of the availability of the model conditions. If public notification has been completed on the basis of different draft conditions from the model conditions, the model conditions cannot be used unless the applicant wishes to re-notify.

Amendments

For amendment applications where the amendment involves altering activities covered in the model mining conditions, negotiation with the EA holder should take place such that the original conditions are amended to reflect the model mining conditions to the extent of the changed impacts as a result of the alteration to activities. If there is no increase in impacts or only a trivial increase in impacts as a result of the change, this is not an opportunity to impose the model conditions on an existing project, except to the extent that the applicant seeks to adopt the model conditions.

Compulsory amendments

Where there are continual non-compliance issues and the model conditions would clearly alleviate the non-compliance then they can be used without negotiation, to the extent of the changed impacts as a result of the non-compliance. If there is no increase in impacts or only a trivial increase in impacts as a result of the non-compliance, this is not an opportunity to impose the model conditions on an existing project, except to the extent that the applicant seeks to adopt the model conditions.

The guidance above about not imposing model conditions on an existing mine without the consent of the holder obviously does not apply if the particular model conditions are considered necessary to address 1 or more of the circumstances listed in section 215(2) of the EP Act, for example, if an existing condition was on the basis of materially misleading information or it would overcome contraventions of the EP Act. However, in that situation, the model conditions should only be compulsorily imposed to the extent necessary to address the particular circumstance triggered by section 215.

Transfer of environmental authority holder

The model conditions should not be imposed upon a transfer, unless at the request of the transferee.

Holders may choose to apply

Holders of environmental authorities for existing mines may apply to adopt model conditions either in whole or on a schedule by schedule basis (or even part of a schedule, for example, if the existing mine has some site-specific conditions on a particular topic and other pro forma conditions). However, if a holder for an existing mine applies to adopt model conditions on 1 topic, this does not mean that model conditions on a different topic can be imposed in response to that amendment application. Similarly, if an application for an extension project is lodged, this should not be seen as an opportunity to impose the model conditions retrospectively on the existing mine except with the agreement of the holder.

If additional conditions are needed to manage particular site-specific or project-specific risks, they may be included. A company may also propose alternative conditions for particular site circumstances for negotiations with the department.

Further information

The latest version of this publication can be found at www.ehp.qld.gov.au using the publication number EM944 as a search term.

Note:

Explanatory notes are in green. Please delete prior to issue of EA.

Insertions required by applicants and/or the administering authority are in blue. Please delete prior to issue.

If an impact is not objectively relevant to the particular location or the project, then, unless the applicant has specifically requested the model conditions on that topic, there is no need to include conditions about it (for example, if the application does not include sewage treatment plants, there is no need to include conditions about them). Potentially, an applicant may request model conditions relating to an impact even if it is not relevant at the time of the decision, in case it becomes relevant later for reasons beyond the control of the applicant, such as residential development encroaching in future in the direction of a mine.

The terms 'sensitive place' and 'commercial place' used in these model conditions do not include places that are within the boundaries of the mining lease, nor places that are owned or leased by the holder of the authority or its related companies. For example, a mining camp operated by the holder of the authority would not be a sensitive place.

Schedule A - General

- A1** This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.

Explanatory note – The first version of A2 may be used where the supporting EIS or application documents have enough information to demonstrate that an acceptable level of ground-truthing has been done on potential for flora/fauna impacts and other risk assessment so that EHP is comfortable that the right areas have been identified to indicate no go areas. If the EIS or other supporting information only proposes 2 types of areas (those to be disturbed and those not to be disturbed), it is only necessary to use paragraphs a) and b) below. However, if the EIS or other supporting information addresses and justifies limited disturbance within a mapped area, paragraph c) may be added, on the basis that the conditions for that limited disturbance are set out elsewhere in the conditions or in a report that is adopted by the conditions. If the limited disturbance relates to flora and fauna, refer to condition A3.

Where there is not enough information to show that an acceptable level of ground-truthing has been done, the second version of A2 should be used.

A2 EITHER:

In carrying out the mining activity authorised by this environmental authority, disturbance of land:

- a) may occur in the areas marked 'A'
- b) must not occur in the areas marked 'B'
- c) may occur in the areas marked 'C' on the map that is annexure 1 to this environmental authority, but only in accordance with condition A3.

OR

In carrying out the mining activity authorised by this environmental authority, the holder of this environmental authority must comply with Schedule K—Figure 1a (Project Infrastructure Layout—Mine Area) and Schedule K—Figure 1b (Project Infrastructure Layout—Support Infrastructure).

Explanatory note: Condition A3 should only be used if condition A2 includes optional paragraph c) authorising limited disturbance within a mapped area. These conditions are not to be used in relation to paragraphs a) and b) of condition A2. The model conditions below are examples only. Any authorisation of limited disturbance should be site-specific and based on an assessment of the EIS or other supporting information, including ground-truthing of the areas.

Option 1 (for limited surface infrastructure)

- A3** Any disturbance within the areas marked 'C' on the map that is annexure 1 to this environmental authority:
- a) is only authorised to the extent reasonably necessary for a road, fence, underground service, low-impact telecommunications facility, electrical sub-station, transmission grid works and supply network works, storage depots, similar minor infrastructure and ancillary facilities for any of the above minor infrastructure
 - b) any disturbance within areas marked 'A' or 'C' is not to impact adversely on areas marked 'B'.

Option 2 (authorising sub-surface disturbance)

- A3** Only sub-surface disturbance is authorised within the areas marked 'C' on the map that is annexure 1 to this environmental authority.
- A4** The holder of this environmental authority must:
- a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority
 - b) maintain such measures, plant and equipment in a proper and efficient condition
 - c) operate such measures, plant and equipment in a proper and efficient manner
 - d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

Monitoring

- A5** Except where specified otherwise in another condition of this environmental authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.

Financial assurance

- A6** The activity must not be carried out until the environmental authority holder has given financial assurance to the administering authority as security for compliance with this environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the Act.
- A7** The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the authority is amended.

Risk management

Explanatory note—risk management

Holders have the option of providing a risk management plan which is structured differently from the ISO provided that the alternative approach is reasonably justified.

- A8** The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, by <<Insert date 3 months from date of issue>>

Notification of emergencies, incidents and exceptions

Explanatory note—notification

If notification is given under an alternative notification condition of the environmental authority it is taken to be notification under this condition. If notification is required under sections 320–320G of the EP Act the additional requirements under sections 320–320G apply.

- A9** The holder of this environmental authority must notify the administering authority by written notification within 24 hours, 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.
- A10** Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:
- a) results and interpretation of any samples taken and analysed
 - b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm
 - c) proposed actions to prevent a recurrence of the emergency or incident.

Complaints

- A11** The holder of this environmental authority must record all environmental complaints received about the mining activities including:
- a) name, address and contact number for of the complainant
 - b) time and date of complaint
 - c) reasons for the complaint
 - d) investigations undertaken
 - e) conclusions formed
 - f) actions taken to resolve the complaint
 - g) any abatement measures implemented
 - h) person responsible for resolving the complaint.

- A12** The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

Third-party reporting

- A13** The holder of this environmental authority must:
- a) within 1 year of the commencement of this environmental authority, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority
 - b) obtain further such reports at regular intervals, not exceeding 3 yearly intervals, from the completion of the report referred to above; and
 - c) provide each report to the administering authority within 90 days of its completion.

-
- A14** Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority, the holder of this environmental authority must:
- a) comply with the amended or changed standard, policy or guideline within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in condition **XX**, the time specified in that condition
 - b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Schedule B - Air

Point source releases to air

- B1** Discharges of contaminants to air from the activity, other than dust and particulate matter addressed by condition B4, must be in accordance with **Tables B1—release points (air)** and **B2—contaminant limits (air)**.
- B2** Conduct a monitoring program of contaminant releases to the atmosphere at the release points, frequency and for the contaminants specified in **Table B2—contaminant limits (air)** and which complies with the most recent edition of AS4323.1 Stationary source emissions method 1: Selection of sampling positions, and the most recent edition of the administering authority's air quality sampling manual.

Table B1—release points (air)

Release point	Release point description	Source description	Minimum release height (metres above ground)	Minimum exit gas temperature (°C)	Minimum efflux velocity (m/s)
RP1	Processor mainstack	Mineralprocessor			
RP2	Drier stack	Crusher and drier			

Table B2—contaminant limits (air)

Contaminant	Release point	Limit type	Release limit	Release limit units	Minimum monitoring frequency

- B3** The release of point source and fugitive emissions from the mining activities must not cause the concentrations of the contaminants listed in Table XX, when measured at [a sensitive place or at specified monitoring stations], to exceed the levels shown in Table XX.

Dust and particulate matter monitoring

Explanatory note—sources of PM_{2.5} are primarily from combustion sources and PM_{2.5} is unlikely to be elevated if significant combustion sources are not present. Condition B4(c) will therefore only be required if there is a significant source of air emissions from combustion sources.

The 5 exceedances for the PM₁₀ standard outlined in B4 (b) were introduced to account for the impact of bushfires, dust storms and fuel reduction burning for fire management purposes. The 5 exceedances are in essence arbitrary in that the number was chosen as it is difficult to determine exactly the number of times these events may happen in any one year. More than 5 exceedances as a result of one or more of these events would not be considered to be a breach of condition.

- B4** The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the dust and particulate matter emissions generated by the mining activities do not cause exceedances of the following levels when measured at any sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air—Determination of particulate matter—Deposited matter – Gravimetric method.

- b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM₁₀) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, for no more than 5 exceedances recorded each year, when monitored in accordance with the most recent version of either:
 - 1. Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM₁₀ high volume sampler with size-selective inlet – Gravimetric method; or
 - 2. Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM₁₀ low volume sampler—Gravimetric method.
- c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM_{2.5}) suspended in the atmosphere of 25 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.10 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM (sub)2.5(/sub) low volume sampler—Gravimetric method.
- d) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—Total suspended particulate matter (TSP)—High volume sampler gravimetric method.

Schedule C - Waste management

- C1** General waste must only be disposed of into the waste disposal trench facility of <insert tenement number> and identified in Schedule # Figure # – Site Map.

Explanatory note—burning

If it can be demonstrated that other possible options have been considered in accordance with the waste management hierarchy, burning may also be permitted for mining activities in addition to clearing for extraction activities.

- C2** Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.
- C3** The holder of this environmental authority may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.

Tailings disposal

- C4** Tailings must be managed in accordance with procedures contained within the current plan of operations. These procedures must include provisions for:
- a) containment of tailings
 - b) the management of seepage and leachates both during operation and the foreseeable future
 - c) the control of fugitive emissions to air
 - d) a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings
 - e) maintaining records of the relative locations of any other waste stored within the tailings
 - f) rehabilitation strategy
 - g) monitoring of rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

Acid sulphate soils

- C5** Treat and manage acid sulphate soils in accordance with the latest edition of the Queensland Acid Sulfate Soil Technical Manual.

Schedule D - Noise

Noise limits

- D1** The holder of this environmental authority must ensure that noise generated by the mining activities does not cause the criteria in **Table D1 – Noise limits** to be exceeded at a sensitive place or commercial place.

Table D1 – Noise limits

Sensitive Place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and Public Holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
LAeq, adj, 15 mins	CV = 50 AV = 5	CV = 45 AV = 5	CV = 40 AV = 0	CV = 45 AV = 5	CV = 40 AV = 5	CV = 35 AV = 0
LA1, adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5
Commercial Place						
Noise level dB(A) measured as:	Monday to Saturday			Sundays and Public Holidays		
	7am to 6pm	6pm to 10pm	10pm to 7am	7am to 6pm	6pm to 10pm	10pm to 7am
LAeq, adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5

Table D1 – Noise limits notes:

1. CV = Critical Value
2. AV = Adjustment Value
3. To calculate noise limits in Table D1:
 If $bg \leq (CV - AV)$:
 Noise limit = $bg + AV$
 If $(CV - AV) < bg \leq CV$:
 Noise limit = CV
 If $bg > CV$:
 Noise limit = $bg + 0$
4. In the event that measured bg (**LA90, adj, 15 mins**) is less than 30 dB(A), then 30 dB(A) can be substituted for the measured background level
5. bg = background noise level (**LA90, adj, 15 mins**) measured over 3-5 days at the nearest sensitive receptor
6. If the project is unable to meet the noise limits as calculated above alternative limits may be calculated using the processes outlined in the "Planning for Noise Control" guideline.

Airblast overpressure nuisance

D2 The holder of this environmental authority must ensure that blasting does not cause the limits for peak particle velocity and air blast overpressure in **Table D2 – Blasting noise limits** to be exceeded at a sensitive place or commercial place.

Table D2 – Blasting noise limits

Blasting noise limits	Sensitive or commercial Blasting noise limits place limits	
	7am to 6pm	6pm to 7am
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 bB (Linear) Peak at any time	<insert either no blasting or limits justified by proponent not less stringent than 7am – 6pm>
Ground vibration peak particle velocity	5mm/second peak particle velocity for 9 out of 10 consecutive blasts and not greater than 10 mm/second peak particle velocity at any time	<insert either no blasting or limits justified by proponent not less stringent than 7am – 6pm>

Monitoring and reporting

- D3** Noise monitoring and recording must include the following descriptor characteristics and matters:
- a) LAN,T (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins)
 - b) background noise LA90
 - c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels
 - d) atmospheric conditions including temperature, relative humidity and wind speed and directions
 - e) effects due to any extraneous factors such as traffic noise
 - f) location, date and time of monitoring
 - g) if the complaint concerns low frequency noise, Max LpLIN,T and one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range.
- D4** The holder of this environmental authority must develop and implement a blast monitoring program to monitor compliance with **Table D2 – Blasting noise limits** for:
- a) at least <insert number> % of all blasts undertaken on this site in each <insert period for example, month or year> at the nearest sensitive place or commercial place <at insert a place nominated in this authority>
 - b) all blasts conducted during any time period specified by the administering authority at the nearest sensitive place or commercial place.

Schedule E - Groundwater

Contaminant release

Explanatory note— the first version of condition E1 is only to be used when it has been identified that no release of contaminants to groundwater is to occur as a result of mining activities. The definition of a ‘contaminant’ is set out in Section 11 of the EP Act and relevantly includes any ‘gas, liquid or solid’, not just hazardous contaminants. For example, it would include the replenishment of aquifers with water of the same quality or higher quality than the aquifers.

The term ‘release’ is defined in Schedule 4 of the EP Act and relevantly, it should be noted that this includes passive releases and not merely controlled releases. Accordingly, if it is likely that the activity will lead to the passive replenishment of aquifers, even with good quality water, version 1 of condition E1 should not be used.

In relation to version 2 of condition E1 - Section 63 of the Environmental Protection Regulation 2008 addresses the topic of the release of ‘waste’ to groundwater. The term ‘waste’ is defined in Section 13 of the EP Act.

Section 63 of the EP Regulation requires the administering authority to refuse an application if:

- a) the waste is not being, or may not be, released entirely within a confined aquifer (except for petroleum activities); or
- b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or
- c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.

Paragraph b) is not intended to apply to a surface ecological system which is authorised to be cleared for the purpose of the mining activities. Paragraphs b) and c) are not intended to apply to trivial impacts.

Where contaminants are proposed to be released to groundwater the limits set out in the condition must not be exceeded at the release point. All the potential contaminants generated as part of the mining activity that have a release limit will be included in this table. The limit type and value will need to be determined in consultation with the administering authority.

E1 EITHER

The holder of this environmental authority must not release contaminants to groundwater.

Or

The holder of this environmental authority is authorised to release contaminants at the release points and at the release frequencies specified in **Table E1 - Groundwater release points, frequency** and comply with the release limits specified in **Table E2 - Groundwater release quality**.

Table E1 - Groundwater release points, frequency

Release points	Release Frequency	Location	
		Easting (GDA94 – Zone 54)	Northing (GDA94 – Zone 54)

Table E2 - Groundwater release quality

Parameter	Release limit

Monitoring and reporting

- E2** All determinations of groundwater quality and biological monitoring must be performed by an appropriately qualified person.
- E3** Groundwater quality and levels must be monitored at the locations and frequencies defined in **Table - E3 Groundwater monitoring locations and frequency** and [Schedule # – Figure #](#) (Groundwater Bore Monitoring Locations) for quality characteristics identified in **Table E4 - Groundwater quality triggers and limits**.

Table E3 - Groundwater monitoring locations and frequency

Monitoring Point	Location		Surface RL (m) ¹	Monitoring Frequency
	Easting (GDA94 – Zone 54)	Easting (GDA94 – Zone 54)		
Reference Bores²				
Compliance Bores				

1. Monitoring is not required where a bore has been removed as a direct result of the mining activity.
2. RL must be measured to the nearest 5cm from the top of the bore casing.
3. Reference sites must:
 - (a) have a similar flow regime;
 - (b) be from the same bio-geographic and climatic region;
 - (c) have similar geology, soil types and topography; and
 - (d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site.

Table E4 - Groundwater quality triggers and limits

Parameter	Contaminant Triggers	Contaminant Limit

E4 Groundwater levels when measured at the monitoring locations specified in **Table E3 -Groundwater monitoring locations and frequency** must not exceed the groundwater level trigger change thresholds specified in **Table E5 - Groundwater level monitoring** below.

Table E5 - Groundwater level monitoring

Monitoring location	Level trigger threshold

Monitoring location	Level trigger threshold

Exceedance Investigation

- E5** If quality characteristics of groundwater from compliance bores identified in **Table E3 - Groundwater monitoring locations and frequency** exceed any of the trigger levels stated in **Table E4 - Groundwater quality triggers and limits** or exceed any of the groundwater level trigger threshold stated in **Table E5 - Groundwater level monitoring**, the holder of this environmental authority must compare the compliance monitoring bore results to the reference bore results and complete an investigation in accordance with the ANZECC and ARMCANZ 2000.

- E6** Results of monitoring of groundwater from compliance bores identified in **Table E3 - Groundwater monitoring locations and frequency**, must not exceed any of the limits defined in **Table E4 - Groundwater quality triggers and limits**.

Bore construction and maintenance and decommissioning.

- E7** The construction, maintenance and management of groundwater bores (including groundwater monitoring bores) must be undertaken in a manner that prevents or minimises impacts to the environment and ensures the integrity of the bores to obtain accurate monitoring

Schedule F - Water (Fitzroy model conditions)

Explanatory note—the model conditions in this schedule are based on the Model Water conditions for coal mines in the Fitzroy River Basin. Alterations to the conditions will be necessary in different catchments to capture the environmental values, use of water resources and the quality characteristics of those catchments. Similarly, alterations will be required for mines other than coal mines.

An alternative approach to the surface water release conditions contained within this guideline is available based on the Isaac River mine water release pilot. Certain prerequisites will have to be met before a mining activity may apply to adopt the pilot water release conditions.

It should also be noted that these conditions may be subject to amendments that are dependent on the outcome of the Isaac River mine water release pilot.

Contaminant release

Explanatory note—the definition of ‘mine affected water’ is set out in the Definitions Schedule. The release of waters other than mine affected waters does not need to be listed in Table F1 (eg: overland flow water that has been diverted around mine infrastructure). 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 run-off containing sediment only that is not likely to have properties that would cause environmental harm based on the water quality parameters for mine affected water in Tables ##, do not need to be identified in Table F1.

There is no intention to prevent the internal transfer of waters on mine sites. Where this is adequately addressed in a water management plan, condition F3 is not required.

In addition, there is no requirement to list in Table F1 the holder’s or third parties’ artificial storage or transfer structures or other beneficial re-use points which are authorised under condition F24 (Water re-use).

- F1** Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this environmental authority.
- F2** Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in **Table F1 - Mine affected water release points, sources and receiving waters** and depicted in Figure 1 attached to this environmental authority.
- F3** The release of mine affected water to internal water management infrastructure installed and operated in accordance with a water management plan that complies with condition F28 is permitted.

Table F1 - Mine affected water release points, sources and receiving waters

Release Point (RP)	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Mine Affected Water Source and Location	Monitoring Point	Receiving waters description
RP 1	XXXX	XXXX	e.g. Stormwater Dam Spillway Overflow	Dam Spillway	Wet Creek
RP 2	XXXX	XXXX	e.g. Dam overflow pipe	Sampling Tap on pipe where the pipe enters Sandy Creek	Sandy Creek

- F4** The release of mine affected water to waters in accordance with condition F2 must not exceed the release limits stated in **Table F2 - Mine affected water release limits** when measured at the monitoring points specified in **Table F1 - Mine affected water release points, sources and receiving waters** for each quality characteristic.

Table F2 - Mine affected water release limits

Quality Characteristic	Release Limits	Monitoring frequency	Comment
Electrical conductivity (uS/cm)	Release limits specified in Table F4 for variable flow criteria or condition F11.	Daily during release (the first sample must be taken within 2 hours of commencement of release)	
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	Daily during release (the first sample must be taken within 2 hours of commencement of release)	
Turbidity (NTU)	Current limit or limit derived from suspended solids limit and demonstrated correlation between turbidity to suspended solids historical monitoring data for dam water*	Daily during release* (first sample within 2 hours of commencement of release)	Turbidity is required to assess ecosystems impacts and can provide instantaneous results.

F5 The release of mine affected water to waters from the release points must be monitored at the locations specified in **Table F1 - Mine affected water release points, sources and receiving waters** for each quality characteristic and at the frequency specified in **Table F2 - Mine affected water release limits** and **Table F3 - Release contaminant trigger investigation levels, potential contaminants**.

Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition F5 is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Explanatory note— the quality characteristics listed in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** should be assessed on a site by site basis by each mine prior to finalisation of amendment applications. The assessment should take into account such characteristics as the geology and chemical characteristics of the land to be disturbed, the types of contaminants likely to be found in processing and quality characteristics of receiving waters.

Based on this assessment, the quality characteristic should be either not be included in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** if below trigger levels; or included as priority contaminants in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** if above trigger levels. Assessment should involve comparison of representative data from dams that have historically been discharged or likely to be discharged from contaminant release points in **Table F1 - Mine affected water release points, sources and receiving waters**. Data may include historical results or sampling undertaken for this specific purpose.

It could also be demonstrated based on existing water quality information that the water source and relative water quality of some dams are the same, in which case such dams may not need to be sampled individually. For metals and metalloids, trigger levels apply if dissolved results exceed trigger levels. However, total (unfiltered) results for metals and metalloids can be used to disregard a characteristic for inclusion in **Table F3 - Release contaminant trigger investigation levels, potential contaminants**.

Table F3 - Release contaminant trigger investigation levels, potential contaminants

Quality Characteristic	Trigger Levels (µg/L)	Comment on Trigger Level	Monitoring Frequency
Aluminium	55	<i>For aquatic ecosystem protection, based on SMD guideline</i>	Commencement of release and thereafter weekly during release
Arsenic	13	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Cadmium	0.2	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Chromium	1	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Copper	2	<i>For aquatic ecosystem protection, based on LOR for ICPMS</i>	
Iron	300	<i>For aquatic ecosystem protection, based on low reliability guideline</i>	
Lead	4	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Mercury	0.2	<i>For aquatic ecosystem protection, based on LOR for CV FIMS</i>	
Nickel	11	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Zinc	8	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Boron	370	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Cobalt	90	<i>For aquatic ecosystem protection, based on low reliability guideline</i>	
Manganese	1900	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Molybdenum	34	<i>For aquatic ecosystem protection, based on low reliability guideline</i>	
Selenium	10	<i>For aquatic ecosystem protection, based on LOR for ICPMS</i>	
Silver	1	<i>For aquatic ecosystem protection, based on LOR for ICPMS</i>	
Uranium	1	<i>For aquatic ecosystem protection, based on LOR for ICPMS</i>	
Vanadium	10	<i>For aquatic ecosystem protection, based on LOR for ICPMS</i>	
Ammonia	900	<i>For aquatic ecosystem protection, based on SMD guideline</i>	
Nitrate	1100	<i>For aquatic ecosystem protection, based on ambient Qld WQ Guidelines (2006) for TN</i>	
Petroleum hydrocarbons (C6-C9)	20		
Petroleum hydrocarbons	100		

(C10-C36)			
Fluoride (total)	2000	<i>Protection of livestock and short term irrigation guideline</i>	
Sodium	TBA		
Suspended Solids	Limit to be determined based on receiving water reference data and achievable best practice sedimentation control and treatment*		
Sulphate (SO4 ²⁻) (mg/L)	Limit to be determined based on receiving water reference data and achievable best practice sedimentation control and treatment*	<i>Drinking water environmental values from NHMRC 2006 guidelines OR ANZECC</i>	

Table F3 - Release contaminant trigger investigation levels, potential contaminants notes:

1. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
2. The quality characteristics required to be monitored as per **Table F3 - Release contaminant trigger investigation levels, potential contaminants** can be reviewed once the results of 2 years monitoring data is available, or if sufficient data is available to adequately demonstrate negligible environmental risk, and it may be determined that a reduced monitoring frequency is appropriate or that certain quality characteristics can be removed from **Table F3 - Release contaminant trigger investigation levels, potential contaminants** by amendment.
3. SMD – slightly moderately disturbed level of protection, guideline refers ANZECC & ARMCANZ (2000).
4. LOR – typical reporting for method stated. ICPMS/CV FIMS – analytical method required to achieve LOR.

F6 If quality characteristics of the release exceed any of the trigger levels specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** during a release event, the environmental authority holder must compare the down stream results in the receiving waters to the trigger values specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** and:

- a) where the trigger values are not exceeded then no action is to be taken; or
- b) where the down stream results exceed the trigger values specified **Table F3 - Release contaminant trigger investigation levels, potential contaminants** for any quality characteristic, compare the results of the down stream site to the data from background monitoring sites and
 1. if the result is less than the background monitoring site data, then no action is to be taken; or

2. 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 90 days of receiving the result , outlining
 - (i) details of the investigations carried out
 - (ii) actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F6 b (2) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

- F7** If an exceedance in accordance with condition F6 b (2) is identified, the holder of the environmental authority must notify the administering authority in writing within 24 hours of receiving the result.

Mine Affected Water Release Events

- F8** The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants**.

- F9** Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with condition F2 must only take place during periods of natural flow in accordance with the receiving water flow criteria for discharge specified in **Table F4 - Mine affected water release during flow events** for the release point(s) specified in **Table F1 - Mine affected water release points, sources and receiving waters**.

- F10** The release of mine affected water to waters in accordance with condition F2 must not exceed the Maximum Release Rate (for all combined release point flows) for each receiving water flow criterion for discharge specified in **Table F4 - Mine affected water release during flow events** when measured at the monitoring points specified in **Table F1 - Mine affected water release points, sources and receiving waters**.

or

- F11** The 80th percentile of electrical conductivity (EC) values recorded at the downstream monitoring points listed in **Table F4 - Mine affected water release during flow events** must not exceed XXXuS/cm over the duration of the release influence period and have a maximum value of no greater than 20 per cent of XXXuS/cm. The 80th percentile must be calculated using all EC values recorded by the monitoring station during the release influence period.

Note: The release influence period is the period during which the downstream monitoring points are influenced by mine affected water releases and includes both the duration of release and any lag time between release point/s and downstream monitoring points.

Explanatory note— Table F4 – Mine affected water release during flow events

Gauging station description:

The intent here is that every release point in **Table F1 - Mine affected water release points, sources and receiving waters** is associated with a gauging station that measures flow upstream of the discharge point. More than 1 discharge point may be associated with the same gauging station. The gauging station should be at a minimum distance from the discharge point such that water flow under trigger flow events will not significantly diminish by the time it reaches the discharge point.

The location of the gauging station should ideally be such that it is not significantly affected by other upstream point source releases or times of discharge are limited to periods of “natural” flow. In the situation where there is an existing gauging station that is capable of performing all the monitoring functions required by these conditions, this gauging station may be used instead of having to install a new gauging station. Agreement to access the gauging stations is the responsibility of the environmental authority holder and is to be provided in writing to the administering authority.

Under certain circumstances it may be appropriate to have a downstream gauging station in addition to or in replacement of an upstream gauging station. The location should ideally not be affected by the discharge (for example, be measured off the main waterway). The need for this must be demonstrated on a case by case basis to show why an upstream gauging station is insufficient. This may be the case when mines are located in the upper parts of catchments or near the downstream confluence or a major waterway. Similarly, the gauging station should be at a distance from the discharge point such that water flow during triggered flow events will not significantly diminish between the discharge point and the measuring point (or the confluence with the creek being measured). For downstream flow triggers, some changes to calculation for flow triggers and maximum release flows would typically be required based on the relative sizes of the waterways involved.

Flow Triggers and EC Quality Criteria:

The intent for flow triggers is that the times of discharge are limited to times around natural flow events only. Different flow regime methodologies are used to define mine affected water release opportunities, provide flexibility for site operators and to protect identified environmental values within receiving waters. The expectation is that where flow gauging data is available, it is used to calculate flow triggers. Where gauging data is not available or is insufficient, flow triggers should be based on runoff/stream flow estimates using appropriate hydrological calculations or models and known catchment area, rainfall estimations etc.

Separate methodologies for discharges which occur to local waterways rather than regional waterways will be applied as part of this revised approach. Due to the increased flexibility of the revised approach and consideration of a wider range of local factors the application of these model conditions to individual sites will require case-by case assessment and require sufficient background information to be provided. For example, it should be noted that discharges upstream of dams or lakes may require special considerations and generally stricter controls. Also, where multiple mines discharge to the same or closely connected waterways consideration of cumulative impacts will be necessary as part of the assessment process.

Model conditions do not preclude applicants from proposing alternative or additional conditions, nor restrict the administering authority from using alternative conditions where the case warrants. However, applications proposing alternative approaches will need to be supported by sufficient environmental risk assessment and contingency planning information to allow the administering authority to adequately consider the proposal.

There may be instances where case-by-case proposals can be considered for conditions to address management of particularly heavy rainfall and flooding that is similar to previous events, where there is sufficient information available based on: previous transitional environmental programs, monitoring and analysis, the environmental values of the receiving environment together with the experience of impacts on those environmental values, rigorous contingency and disaster response planning, and with particular regard to actual and potential cumulative impacts. For example, there may be potential to tailor a schedule of conditions to be triggered upon reaching nominated thresholds of rainfall, flow, flooding (or a combination) based on learning from an event that has occurred in the past; possibly adopting a similar framework to previous discharge permissions granted in similar circumstances, provided the framework was demonstrated to adequately address environmental risk to the satisfaction of the delegate.

No/low flow stream conditions (best quality / low EC mine affected water):

Discharge water quality will need to meet or be better than water quality objectives (or long term background reference 75th / 80th percentile) for EC and will only be permitted for temporary periods after periods of significant flow. The focus of this is to allow “good” quality water to be released when collected rather than having it stored over long durations resulting in deteriorating water quality. Any discharges made under no/low flow stream conditions must not contribute to or cause erosion and due consideration should be given to road/rail access, stock crossings etc. (particularly in relation to multiple mines discharging under no/low flow stream conditions on connected waterways). General principles include:

- a) Release at times when flow is on tail end of flow event only that is, following a flow above specified event flow trigger and when the flow reduces below the flow trigger again. This trigger will commence a discharge window of 4-6 weeks for good quality water only
- b) End of pipe WQ ≤ WQO (or long term background reference 75th/80th percentile). May require assessment of downstream environmental values where WQO is more stringent (for example, drinking water supply)
- c) Duration of release is limited (dry ephemeral stream, 4 weeks after flow event ceases, use time after flow trigger for below – add additional time)
- d) Volume/rate will be considered on a case by case basis.

Medium flow stream conditions (medium quality mine affected water):

A flow trigger for the stream is required and will be set to avoid discharge of medium quality water during periods of no or low flow. General principles include:

- a) Requires the use of a stream flow trigger above which release can occur. The stream flow trigger must be representative of event flow and be above base/low flow (typically determined from hydrographs, historical flow/water quality data and/or modeling)
- b) End-of pipe EC <3500uS/cm. Options for either <1500us/cm and <3500uS/cm as maximum limits can be considered which will result in different maximum discharge rates for different quality water. The better the quality of water to be released, the greater the volume that can be permitted
- c) The design dilution/maximum discharge rate should be based on a site specific risk assessment. These should be designed to achieve an in-stream EC based on the location – upper (Zone 1), mid (Zone 2) or lower (Zone 3) catchment. The EC_{WQO high flow} should be adopted as background EC for design calculations
 - Zone 1, upper catchment mines, approximately <10km from top of waterway catchment.
EC_{in stream} = 1000uS/cm (toxicity guideline).
 - Zone 2, mid catchment mines, zones not within Zone 1 or Zone 3
EC_{in stream} = 700uS/cm
 - Zone 3, lower catchment mines (All regional waterways are considered Zone 3 from distance >50km from top of waterway catchment, refer to Zone 3 map) –
EC_{in stream} = EC_{high flow WQO} + multiplier x (EC_{WQO low flow} – EC_{WQO high flow})
for example, multiplier = 0.2 for Isaac, Nogo, Dawson
- d) EC in stream for calculations may vary according to other locally relevant environmental values that may need to be considered.

High flow stream conditions (poorer quality water):

This option might be used in some cases for mines that need to discharge higher EC wastewater than is allowable under medium flow stream conditions. Any discharge is required to have a higher level of dilution than with medium flow cases but still achieve a maximum incremental increase in the waterway. This option is most feasible for mines situated on regional waterways as the window for discharge is likely to be limited for local waterways. Some additional considerations on management of mixing zones and acute/chronic toxicity may be required in this case. General principles include:

- a) Requires the use of a stream flow trigger above which release can occur. The stream flow trigger must be representative of high event flow and be above medium flow (typically determined from hydrographs, historical flow/water quality data and/or modeling)
- b) End-of pipe EC must be > 3500uS/cm (but <10,000uS/cm). The better the quality of water to be released, the greater the volume that can be permitted
- c) The design dilution/maximum discharge rate should be based on a site specific risk assessment. These should be designed to achieve an in-stream EC based on the location – upper (Zone 1), mid (Zone 2) or lower (Zone 3) catchment as described above
- d) May need some additional indicators/requirements and requires case by case assessment

This option is likely to be less feasible for Zone 1 and 2 mines.

Using condition F11 in place of F10

Where condition F11 has been used instead of F10, Table F4 is to be modified to remove references to electrical conductivity release limits. The low, medium and high flow criteria and maximum release rate are also to be removed and replaced with minimum flow in receiving water criteria.

Table F4 - Mine affected water release during flow events

Receiving waters/ stream	Release Point (RP)	Gauging station	Gauging Station Latitude (decimal degree, GDA94)	Gauging Station Longitude (decimal degree, GDA94)	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m ³ /s)	Maximum release rate (for all combined RP flows)	Electrical Conductivity Release Limits
e.g. Wet Creek	Insert all release points that will release based on this gauging station flow. e.g. RP1, RP2 & RP3	e.g. Gauging station 1	XXXX	XXXX	Continuous (minimum daily)	Low Flow <XX m3/s for a period of <insert number of days> after natural flow events that exceed XX m3/s (where XX is a specified event flow trigger)	Insert < xx ML/day or < xx m3/s Volume/rate to be determined on case by case basis	Electrical conductivity (uS/cm): <insert water quality objective or 75th percentile of long term background reference data>
						Medium Flow > XX m3/s (where XX is specified event flow trigger)	< XX m3/s (where XX is the maximum release rate determined on case by case basis)	Electrical conductivity (uS/cm) <insert value determined on case specific basis but typically <1500
							< YY m3/s (where YY is the maximum release rate determined on case by case basis)	Electrical conductivity (uS/cm) <insert value determined on case specific basis but typically <3500
						High Flow > ZZ m3/s (where ZZ is a specified high flow event trigger)	< ZZ m3/s (where ZZ is the maximum release rate determined on case by case basis)	Electrical conductivity (uS/cm) <insert value determined on case specific basis but typically within a range of <3500 to <10,000

- F12** The daily quantity of mine affected water released from each release point must be measured and recorded.
- F13** Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

Notification of Release Event

- F14** The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment. Notification must include the submission of written advice to the administering authority of the following information:
- a) release commencement date/time
 - b) details regarding the compliance of the release with the conditions of Department Interest: Water of this environmental authority (that is, contaminant limits, natural flow, discharge volume)
 - c) release point/s
 - d) release rate
 - e) release salinity
 - f) receiving water/s including the natural flow rate.

Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local Administering Authority via email or facsimile.

- F15** The environmental authority holder must notify the administering authority as soon as practicable and nominally no later than 24 hours after cessation of a release event of the cessation of a release notified under Condition F14 and within 28 days provide the following information in writing:
- a) release cessation date/time
 - b) natural flow rate in receiving water
 - c) volume of water released
 - d) details regarding the compliance of the release with the conditions of Department Interest; Water of this environmental authority (i.e. contaminant limits, natural flow, discharge volume)
 - e) all in-situ water quality monitoring results
 - f) 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 F14 and F15, provided the relevant details of the release are included within the notification provided in accordance with conditions F14 and F15.

Notification of Release Event Exceedance

- F16** If the release limits defined in **Table F2 - Mine affected water release limits** are exceeded, the holder of the environmental authority must notify the administering authority within 24 hours of receiving the results.

F17 The environmental authority holder must, within 28 days of a release that is not compliant with the conditions of this environmental authority, provide a report to the administering authority detailing:

- a) the reason for the release
- b) the location of the release
- c) the total volume of the release and which (if any) part of this volume was non-compliant
- d) the total duration of the release and which (if any) part of this period was non-compliant
- e) all water quality monitoring results (including all laboratory analyses)
- f) identification of any environmental harm as a result of the non compliance
- g) all calculations
- h) any other matters pertinent to the water release event.

Receiving Environment Monitoring and Contaminant Trigger Levels

F18 The quality of the receiving waters must be monitored at the locations specified in **Table F6 - Receiving water upstream background sites and down stream monitoring points** for each quality characteristic and at the monitoring frequency stated in **Table F5 - Receiving waters contaminant trigger levels**.

Table F5 - Receiving waters contaminant trigger levels

Quality Characteristic	Trigger Level	Monitoring Frequency
pH	6.5 – 9.0	Daily during the release
Electrical Conductivity (µS/cm)	TBA Note: for protection against toxicity this may need to be reduced in some circumstances e.g. where in close proximity upstream of a drinking water dam or regional waterway	
Suspended solids (mg/L)	To Be Determined. Turbidity may be required to assess ecosystems impacts and can provide instantaneous results.	
Sulphate (SO ₄ ²⁻) (mg/L)	250 (Protection of drinking water Environmental Value)	

Table F6 - Receiving water upstream background sites and down stream monitoring points

Monitoring Points	Receiving Waters Location Description	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)
Upstream Background Monitoring Points			
Monitoring Point XX	XXXX Creek XX metres upstream of RP XX	XXXX	XXXX
Monitoring Point XX	XXXX Creek XX metres upstream of RP XX	XXXX	XXXX
Downstream Monitoring Points			
Monitoring Point XX	XXXX Creek XX metres downstream of RP XX	XXXX	XXXX
Monitoring Point XX	XXXX Creek XX metres downstream of RP XX	XXXX	XXXX

Table F6 - Receiving water upstream background sites and down stream monitoring points notes:

- a) *The upstream monitoring point should be within Xkm the release point.*
- b) *The downstream point should not be greater than Xm from the release point.*
- c) *The data from background monitoring points must not be used where they are affected by releases from other mines.*

F19 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in **Table F5 - Receiving waters contaminant trigger levels** during a release event the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and:

- a) where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or
- b) where the down stream results exceed the upstream results complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining
 1. details of the investigations carried out
 2. actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F19 b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

F20 All determinations of water quality and biological monitoring must be performed by an appropriately qualified person.

Receiving Environment Monitoring Program (REMP)

- F21** The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site. For the purposes of the REMP, the receiving environment is the waters of the **XX** and connected or surrounding waterways within **XX** (for example, **X**km) downstream of the release. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.
- F22** A REMP Design Document that addresses the requirements of the REMP must be prepared and made available to the administering authority upon request.
- F23** A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the administering authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

Water reuse

Explanatory notes—Water reuse conditions

Mine affected water reuse conditions acknowledge that there is beneficial potential for using mine affected water. How the water is to be reused is not to be stipulated, this is for the third party to determine as they are better placed to make this decision.

- F24** Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party (with the consent of the third party).

Annual Water Monitoring Reporting

- F25** The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format:
- a) the date on which the sample was taken
 - b) the time at which the sample was taken
 - c) the monitoring point at which the sample was taken
 - d) the measured or estimated daily quantity of mine affected water released from all release points
 - e) the release flow rate at the time of sampling for each release point
 - f) the results of all monitoring and details of any exceedances of the conditions of this environmental authority
 - g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Temporary Interference with waterways

- F26** Destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with Department of Natural Resources and Mines (or its successor) *Guideline – Activities in a Watercourse, Lake or Spring associated with Mining Activities*.

Water Management Plan

- F27** A Water Management Plan must be developed by an appropriately qualified person and implemented.

Stormwater and Water sediment controls

- F28** An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

- F29** Stormwater, other than mine affected water, is permitted to be released to waters from:

- a) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition F28
- b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with condition F27, for the purpose of ensuring water does not become mine affected water.

Schedule G - Sewage treatment

Explanatory note—G1 may need amendment if other contaminants are permitted to be released to land. Monthly monitoring of E-coli may be revised based on location/remoteness of mine site.

- G1** The only contaminant permitted to be released to land is treated sewage effluent in compliance with the release limits stated in **Table G1 - Contaminant release limits to land**.

Table G1 - Contaminant release limits to land

Contaminant	Unit	Release limit	Limit type	Frequency
5 day Biochemical oxygen demand (BOD) ¹	mg/L	20	Maximum	Monthly
Total suspended solids	mg/L	30	Maximum	Monthly
Nitrogen	mg/L	30	Maximum	Monthly
Phosphorus	mg/L	15	Maximum	Monthly
E-coli	Organisms/100ml	1000	Maximum	Monthly
pH	pH units	6.0 – 9.0.	Range	Monthly

- G2** Treated sewage effluent may only be released to land in accordance with the conditions of this approval at the following locations:
- (a) within the nominated area(s) identified in [Schedule ##—Figure ##](#) (sewage treatment plant and effluent disposal)
 - (b) other land for the purpose of dust suppression and/or fire fighting.
- G3** The application of treated effluent to land must be carried out in a manner such that:
- (a) vegetation is not damaged
 - (b) there is no surface ponding of effluent
 - (c) there is no run-off of effluent.
- G4** If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.
- G5** All sewage effluent released to land must be monitored at the frequency and for the parameters specified in **Table G1 - Contaminant release limits to land**.
- G6** The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.
- G7** When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store/lawfully dispose of effluent.
- G8** A minimum area of <<insert area>> of land, excluding any necessary buffer zones, must be utilised for the irrigation and/or beneficial reuse of treated sewage effluent.

Explanatory note — the supply of treated wastewater for re-use is regulated under the [Water Supply \(Safety and Reliability\) Act 2008](#).

- G9** Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the Act whilst using the treated sewage effluent.

Schedule H - Land and rehabilitation

Explanatory note—Table H1 - Rehabilitation Requirements

*Tables should be kept as concise as reasonably practicable, without losing clarity. For example, if requirements for more than 1 domain are the same, there is no need to set out a separate row for each domain. The components shown in the table below are only examples of rehabilitation requirements. Only mine features that are present in the mines should be listed. The contents of **Table H1 - Rehabilitation Requirements** below are included as examples only.*

- H1** Land disturbed by mining must be rehabilitated in accordance with **Table H1 - Rehabilitation Requirements**.

Table H1 - Rehabilitation Requirements

Mine Domain	Mine Feature Name	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Dams ML XXXX	Tailings dam	1. Safe	(a) Site safe for humans and animals	(a) Structural, geotechnical and hydraulic adequacy of the dam	
		2. Non-polluting	(a) Acid mine drainage will not cause environmental harm	(a) Technical design of capping (b) Surface and groundwater monitoring	e.g. Monitoring meeting release limits
		3. Stable	(a) Minimise erosion	(a) Engineered structure to control water flow (b) Vegetation cover	e.g. Surface armour/ engineered drop structures in place and functioning e.g. X% foliage cover recorded over a period of X years
		4. Self-sustaining	Describe post mine land use of land suitability or land capability	(a) Species diversity (b) Presence of key species	e.g. Certification that X% species diversity achieved and maintained for X years e.g. Certification that key species present over a period of X years
Waste rock dump					
Infrastructure					
Voids					
Roads					

H2 Rehabilitation must commence progressively in accordance with the plan of operations.

Contaminated Land

- H3** Before applying for surrender of a mining lease, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the mining lease which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use.
- H4** Before applying for progressive rehabilitation certification for an area, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the area the subject of the application which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use under condition H1.
- H5** Minimise the potential for contamination of land by hazardous contaminants.
-

Biodiversity offsets

- H6** The holder of this environmental authority must provide an offset for impacts on applicable state significant biodiversity values, in accordance with Queensland Biodiversity Offset Policy. The biodiversity offset must be consistent with the requirements for an offset as identified in the Biodiversity Offset Strategy (as per condition H7) and must be provided:
- a) prior to impacting on state significant biodiversity values; or
 - b) where a land based offset is to be provided, within 12 months of the later of either of the following
 1. the date of issue of this environmental authority; or
 2. the relevant stage identified in the Biodiversity Offset Strategy submitted under condition H7; or
 - c) where an offset payment is to be provided, within 4 months of the later of either of the following
 1. the date of issue of this environmental authority; or
 2. the relevant stage identified in the Biodiversity Offset Strategy submitted under conditions H7.
- H7** A Biodiversity Offset Strategy must be developed and submitted to the administering authority within either 30 days, or a lesser period agreed to by the administering authority, prior to impacting on the applicable state significant biodiversity values.

End of conditions

ADVICE - OTHER AREAS OF CONCERN TO BE CONSIDERED

Monitoring

Upon request from the administering authority, copies of monitoring records and reports should be made available and provided to the administering authority's nominated office within 10 business days or an alternative timeframe agreed between the administering authority and the holder.

Any management or monitoring plans, systems or programs required to be developed and implemented by a condition of this environmental authority should be reviewed for effectiveness in minimising the likelihood of environmental harm on an annual basis, and amended promptly if required, unless a particular review date and amendment program is specified in the plan, system or program.

Light

A condition about light should not be imposed unless this is likely to be a relevant issue for the mine due to the proximity of sensitive places. If so, the following condition may be included:

- AXX In the event of a complaint about light from any mining activity that, after investigation, is in the opinion of an authorised person causing a nuisance at a sensitive place, the holder of this environmental authority must take appropriate action to mitigate the nuisance. The holder of this environmental authority must take the action within the reasonable time set by the administering authority.

Chemicals and flammable or combustible liquids

All explosives, hazardous chemicals, corrosive substances, toxic substances, gases and dangerous goods should be stored and handled in accordance with the current Australian standard where such is applicable.

Flammable and combustible liquids, including petroleum products, should be stored and handled in accordance with the latest edition of AS1940—The storage and handling of flammable and combustible liquids.

Where no relevant Australian standard exists store such materials within an effective on-site containment system.

Minimise the potential for contamination of land and waters by diverting stormwater around contaminated areas and facilities used for the storage of chemicals and flammable or combustible liquids.

Meteorological monitoring

Environmental authority holders are encouraged to establish and maintain an automatic weather station to measure and record wind speed, wind direction, temperature and rainfall intensity to aid in the compliance with conditions of approval.

It is possible for environmental authority holders to utilise relevant and available weather monitoring information collected by other parties as reference data.

Waste rock

A waste rock and spoil disposal plan should be developed and include, where relevant, at least:

- a) effective characterisation of the waste rock and spoil to predict under the proposed placement and disposal strategy the quality of runoff and seepage generated concerning potentially environmentally significant effects including salinity, acidity, alkalinity and dissolved metals, metalloids and non-metallic inorganic substances
- b) a program of progressive sampling and characterisation to identify dispersive and non-dispersive spoil and the salinity, acid and alkali producing potential and metal concentrations of waste rock

- c) a materials balance and disposal plan demonstrating how potentially acid forming and acid forming waste rock will be selectively placed and/or encapsulated to minimise the potential generation of acid mine drainage
- d) where relevant, a sampling program to verify encapsulation and/or placement of potentially acid-forming and acid-forming waste rock
- e) how often the performance of the plan will be assessed
- f) the indicators or other criteria on which the performance of the plan will be assessed
- g) rehabilitation strategy.

Monitoring or rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of the placed materials, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

Transportation

It is recommended that the holder of the environmental authority ensure that vehicles (including trains) used for transporting bulk materials from mining lease(s), leave the mining lease(s) with appropriate load preparation to prevent the spillage and/or loss of particulate matter and/or windblown dust during transport.

Definitions

Words and phrases used throughout this environmental authority are defined below. Where a definition for a term used in this environmental authority is not provided within this environmental authority, but is provided in the EP Act 1994 or subordinate legislation, the definition in the EP Act or subordinate legislation must be used.

‘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.

‘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).

‘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 relating to the subject matter using the relevant protocols, standards, methods or literature.

‘background’, with reference to the water schedule means the average of samples taken prior to the commencement of mining from the same waterway that the current sample has been taken.

Explanatory note— **‘certification’, ‘certifying’ or ‘certified’**

Only include regulated structures version of this definition if environmental authority controls regulated structures in the conditions.

‘certification’, ‘certifying’ or ‘certified’ by an appropriately qualified and experienced person in relation to a design plan or an annual report regarding dams/structures, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

- a) exactly what is being certified and the precise nature of that certification;
- b) the relevant legislative, regulatory and technical criteria on which the certification has been based;
- c) the relevant data and facts on which the certification has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- d) the reasoning on which the certification has been based using the relevant data and facts, and the relevant criteria.

‘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.

‘chemical’ means:

- a) an agricultural chemical product or veterinary chemical product within the meaning of the Agricultural and *Veterinary Chemicals Code Act 1994* (Commonwealth); or
- b) a dangerous good under the Australian Code for the Transport of Dangerous Goods by Road and Rail approved by the Australian Transport Council; or
- c) a lead hazardous substance within the meaning of the Workplace Health and Safety Regulation 1997;

- d) a drug or poison in the Standard for the Uniform Scheduling of Drugs and Poisons prepared by the Australian Health Ministers' Advisory Council and published by the Commonwealth; or
- e) any substance used as, or intended for use as:
 - (i) a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or
 - (ii) a surface active agent, including, for example, soap or related detergent; or
 - (iii) a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or
 - (iv) a fertiliser for agricultural, horticultural or garden use; or
 - (v) a substance used for, or intended for use for mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or
 - (vi) manufacture of plastic or synthetic rubber.

'commercial place' means a workplace 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.

'construction' or **'constructed'** in relation to a regulated structure includes building a new regulated structure and lifting or otherwise modifying an existing regulated structure, but does not include investigations and testing necessary for the purpose of preparing a design plan.

'disturbance' of land includes:

- a) compacting, removing, covering, exposing or stockpiling of earth;
- b) removal or destruction of vegetation or topsoil or both to an extent where the land has been made susceptible to erosion;
- c) carrying out mining within a watercourse, waterway, wetland or lake;
- d) the submersion of areas by tailings or hazardous contaminant storage and dam/structure walls;
- e) temporary infrastructure, including any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after the mining activity has ceased; or
- f) releasing of contaminants into the soil, or underlying geological strata.

However, the following areas are not included when calculating areas of 'disturbance':

- a) areas off lease (e.g. roads or tracks which provide access to the mining lease);
- b) areas previously disturbed which have achieved the rehabilitation outcomes;
- c) by agreement with the administering authority, areas previously disturbed which have not achieved the rehabilitation objective(s) due to circumstances beyond the control of the mine operator (such as climatic conditions);
- d) areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dam/structures, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner.
- e) disturbance that pre-existed the grant of the tenure.

'EC' means electrical conductivity.

'effluent' treated waste water released from sewage treatment plants.

'hazard category' means a category, either low significant or high, into which a dam is assessed as a result of the application of tables and other criteria in 'Manual for Assessing Hazard Categories and Hydraulic Performance of Dams'.

'infrastructure' means water storage dams, levees,, roads and tracks, buildings and other structures built for the purpose of the mining activity.

'land' in the 'land schedule' of this document means land excluding waters and the atmosphere, that is, the term has a different meaning from the term as defined in the *Environmental Protection Act 1994*. For the purposes of the *Acts Interpretation Act 1954*, it is expressly noted that the term 'land' in this environmental authority relates to physical land and not to interests in land.

'land use' –means the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

'leachate' means a liquid that has passed through or emerged from, or is likely to have passed through or emerged from, a material stored, processed or disposed of at the operational land which contains soluble, suspended or miscible contaminants likely to have been derived from the said material.

'licensed place' means the mining activities carried out at the mining tenements detailed in Table # (page #) of this environmental authority.

'm' means metres.

'mine affected water':

- a) 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 such runoff, 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.

- b) does not include surface water runoff which, to the extent that it has been in contact with areas disturbed by mining activities that have not yet been completely rehabilitated, has only been in contact with:

- i) land that has been rehabilitated to a stable landform and either capped or revegetated in accordance with the acceptance criteria set out in the environmental authority but only still awaiting maintenance and monitoring of the rehabilitation over a specified period of time to demonstrate rehabilitation success; or
- ii) land that has partially been rehabilitated and monitoring demonstrates the relevant part of the landform with which the water has been in contact does not cause environmental harm to waters or groundwater, for example:
 - a. areas that are been capped and have monitoring data demonstrating hazardous material adequately contained with the site;
 - b. evidence provided through monitoring that the relevant surface water would have met the water quality parameters for mine affected water release limits in this environmental authority, if those parameters had been applicable to the surface water runoff; or
- iii) both.

'measures' includes any measures to prevent or minimise environmental impacts of the mining activity such as bunds, silt fences, diversion drains, capping, and containment systems.

'NATA' means National Association of Testing Authorities, Australia.

'natural flow' means the flow of water through waters caused by nature.

'non polluting' means having no adverse impacts upon the receiving environment.

'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 (mm/s).

'protected area' means – a protected area under the *Nature Conservation Act 1992*; or

- a) a marine park under the *Marine Parks Act 1992*; or
- b) a World Heritage Area.

'receiving environment' in relation to an activity that causes or may cause environmental harm, means the part of the environment to which the harm is, or may be, caused. The receiving environment includes (but is not limited to):

- a) a watercourse;
- b) groundwater; and
- c) an area of land that is not specified in Schedule # – Table # (Authorised Activities) of this environmental authority.

The term does not include land that is specified in Schedule # – Table # (Authorised Activities) of this environmental authority.

'receiving waters' means the waters into which this environmental authority authorises releases of mine affected water.

'rehabilitation' the process of reshaping and revegetating land to restore it to a stable landform

'release event' means a surface water discharge from mine affected water storages or contaminated areas on the licensed place.

'RL' means reduced level, relative to mean sea level as distinct from depths to water.

'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 salts, as a result of the mining activity.

‘sensitive place’ means:

- a) a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or
- b) a motel, hotel or hostel; or
- c) an educational institution; or
- d) a medical centre or hospital; or
- e) a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 1992* or a World Heritage Area; or
- f) a public park or gardens.

Note: The definition of ‘sensitive place’ and ‘commercial place’ is based on Schedule 1 of EPP Noise. That is, a sensitive place is inside or outside on a dwelling, library & educational institution, childcare or kindergarten, school or playground, hospital, surgery or other medical institution, commercial & retail activity, protected area or an area identified under a conservation plan under *Nature Conservation Act 1992* as a critical habitat or an area of major interest, marine park under *Marine Parks Act 2004*, park or garden that is outside of the mining lease and open to the public for the use other than for sport or organised entertainment. A commercial place is inside or outside a commercial or retail activity.

A mining camp (i.e., accommodation and ancillary facilities for mine employees or contractors or both, associated with the mine the subject of the environmental authority) is not a sensitive place for that mine or mining project, whether or not the mining camp is located within a mining tenement that is part of the mining project the subject of the environmental authority. For example, the mining camp might be located on neighbouring land owned or leased by the same company as one of the holders of the environmental authority for the mining project, or a related company. Accommodation for mine employees or contractors is a sensitive place if the land is held by a mining company or related company, and if occupation is restricted to the employees, contractors and their families for the particular mine or mines which are held by the same company or a related company.

For example, a township (occupied by the mine employees, contractors and their families for multiple mines that are held by different companies) would be a sensitive place, even if part or all of the township is constructed on land owned by one or more of the companies.

‘the Act’ means the *Environmental Protection Act 1994*.

‘µS/cm’ means micro siemens per centimetre.

‘watercourse’ has the same meaning given in the *Water Act 2000*.

‘water quality’ means the chemical, physical and biological condition of water.

‘waters’ includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined natural or artificial watercourse, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), storm water channel, storm water drain, and groundwater and any part thereof.

Disclaimer:

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

Approved by

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Appendix

Guidance on compliance with model mining conditions

This section provides guidance on how to comply with the general conditions outlined in Model mining conditions guideline, EM944. Officers should also refer to the separate guidelines: Structures which are dams or levees constructed as part of environmentally relevant activities (EM634).

Generally the conditions do not outline 'how' the environmental authority (EA) holder must achieve the required environmental outcomes. This is referred to as outcome focused conditioning. With outcome focused conditioning, it is the responsibility of the EA holder to assess the most efficient and effective way to achieve the outcome for their own particular circumstance.

In addition to outcome-focussed conditions, in some instances 'how to' conditions may be appropriate for site-specific or project-specific reasons. While these 'how' conditions are by nature not outcome focused, they are required to ensure that a clear environmental value that has been identified can be protected.

The following information has been provided to aid the EA holder in determining the most effective and efficient method to achieve compliance with each model condition of an environmental authority. Possible solutions to achieving compliance with each condition are provided but they are not an exhaustive source. It is possible for the EA holder to decide to achieve the condition outcomes in a manner that is different to that outlined below. The EA holder will need to be satisfied that they can demonstrate, if required, that the outcome of the condition can still be achieved by the alternate approach.

Guidance on how to comply with conditions is not provided for every condition. Where there is no guidance provided on how to comply with a condition there may be details of the requirements to meet the desired outcome within the condition.

Please note, if amended conditions are imposed or agreed which involve changes to existing infrastructure, consideration should be given to an appropriate transitional period enabling the infrastructure work to be undertaken and this should be included in the condition, on a case-by-case basis.

Schedule A – General

A1 This environmental authority authorises environmental harm referred to in the conditions. Where there is no condition or this environmental authority is silent on a matter, the lack of a condition or silence does not authorise environmental harm.

How do I comply?

No further guidance provided to that outlined in the condition.

A2 Either:

In carrying out the mining activity authorised by this environmental authority, disturbance of land

- a) may occur in the areas marked 'A'
- b) must not occur in the areas marked 'B'
- c) may occur in the areas marked 'C' but only in accordance with the conditions in Schedule Z on the map that is annexure 1 to this environmental authority.

OR

In carrying out the mining activity authorised by this environmental authority, the holder of this environmental authority must comply with Schedule K—Figure 1a (Project Infrastructure Layout—Mine Area) and Schedule K—Figure 1b (Project Infrastructure Layout—Support Infrastructure).

How do I comply?

The first version of A2 may be used where the supporting EIS or application documents have enough information to demonstrate that an acceptable level of ground-truthing has been done on potential for flora/fauna impacts and other risk assessment so that EHP is comfortable that the right areas have been identified to indicate no go areas. If the EIS or other supporting information only proposes 2 types of areas (those to be disturbed and those not to be disturbed), it is only necessary to use paragraphs a) and b) below. However, if the EIS or other supporting information addresses and justifies limited disturbance within a mapped area, paragraph c) may be added, on the basis that the conditions for that limited disturbance are set out elsewhere in the conditions or in a report that is adopted by the conditions. If the limited disturbance relates to flora and fauna, refer to Schedule Z.

Where there is not enough information to show that an acceptable level of ground-truthing has been done, the second version of A2 should be used.

Option 1 (for limited surface infrastructure)

A3 Any disturbance within the areas marked 'C' on the map that is annexure 1 to this environmental authority:

- a) is only authorised to the extent reasonably necessary for a road, fence, underground service, low-impact telecommunications facility, electrical sub-station, transmission grid works and supply network works, storage depots, similar minor infrastructure and ancillary facilities for any of the above minor infrastructure
- b) any disturbance within areas marked 'A' or 'C' is not to impact adversely on areas marked 'B'.

Option 2 (authorising sub-surface disturbance)

A3 Only sub-surface disturbance is authorised within the areas marked 'C' on the map that is annexure 1 to this environmental authority.

How do I comply?

Condition A3 should only be used if condition A2 includes optional paragraph c) authorising limited disturbance within a mapped area. These conditions are not to be used in relation to paragraphs a) and b) of condition A2. The model conditions are examples only. Any authorisation of limited disturbance should be site-specific and based on an assessment of the EIS or other supporting information, including ground-truthing of the areas.

A4 The holder of this environmental authority must:

- a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority
- b) maintain such measures, plant and equipment in a proper and efficient condition
- c) operate such measures, plant and equipment in a proper and efficient manner
- d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this environmental authority are properly calibrated.

How do I comply?

No further guidance provided other than that outlined in the condition.

Monitoring

A5 Except where specified otherwise in another condition of this environmental authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.

How do I comply?

The holder of the environmental authority should implement a monitoring program that enables the holder and administering authority to determine compliance with this approval.

Financial assurance

A6 The activity must not be carried out until the environmental authority holder has given financial assurance to the administering authority as security for compliance with this environmental authority and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the Act.

How do I comply?

Refer to the latest version of the Financial assurance under the EP Act guideline, which can be located on the administering authority's website at www.ehp.qld.gov.au (search for EM1010).

A7 The amount of financial assurance must be reviewed by the holder of this environmental authority when a plan of operations is amended or replaced or the authority is amended.

How do I comply?

No further guidance provided to that outlined in the condition.

Risk management

A8 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, by <<Insert date 3 months from date of issue>>

How do I comply?

Companies have the option of providing a risk management plan which is structured differently from the ISO provided that the alternative approach is reasonably justified.

Notification of emergencies, incidents and exceptions

A9 The holder of this environmental authority must notify the administering authority by written notification within 24 hours, 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.

How do I comply?

If notification is given under an alternative notification condition of the environmental authority it is taken to be notification under this condition. If notification is required under sections 320–320G of the EP Act the additional requirements under sections 320–320G apply.

The notification should include, but not be limited to:

- a) the environmental authority number and name of the holder
- b) the name and telephone number of the designated contact person
- c) the location of the emergency or incident
- d) the date and time of the emergency or incident
- e) the time the holder of the environmental authority became aware of the emergency or incident
- f) where known
 1. the estimated quantity and type of substances involved in the emergency or incident
 2. the actual or potential cause of the emergency or incident
 3. a description of the nature and effects of the emergency or incident including environmental risks, and any risks to public health or livestock
- g) any sampling conducted or proposed, relevant to the emergency or incident
- h) immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency or incident
- i) what notification of owners and occupiers who may be affected by the emergency or incident has occurred or is being undertaken.

A10 Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:

- a) results and interpretation of any samples taken and analysed
- b) outcomes of actions taken at the time to prevent or minimise unlawful environmental harm
- c) proposed actions to prevent a recurrence of the emergency or incident.

How do I comply?

No further guidance provided to that outlined in the condition.

Complaints

A11 The holder of this environmental authority must record all environmental complaints received about the mining activities including:

- a) name, address and contact number for of the complainant
- b) time and date of complaint
- c) reasons for the complaint
- d) investigations undertaken
- e) conclusions formed
- f) actions taken to resolve the complaint
- g) any abatement measures implemented
- h) person responsible for resolving the complaint.

How do I comply?

No further guidance provided other than that outlined in the condition.

A12 The holder of this environmental authority must, when requested by the administering authority, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the administering authority to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the administering authority within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the administering authority to undertake the investigation.

How do I comply?

No further guidance provided to that outlined in the condition.

Third-party reporting

A13 The holder of this environmental authority must:

- a) within 1 year of the commencement of this environmental authority, obtain from an appropriately qualified person a report on compliance with the conditions of this environmental authority
- b) obtain further such reports at regular intervals, not exceeding 3 yearly intervals, from the completion of the report referred to above; and
- c) provide each report to the administering authority within 90 days of its completion.

How do I comply?

The holder must, at its cost, arrange for independent certification by the third party within 1 year to report on compliance with the conditions of the environmental authority. Within 90 days of completing the report required under condition A13, provide the written report to the administering authority which should contain details of any non-compliance issues that were found (if no non-compliance issues were found this should be stated in the report). If non-compliance issues were found the report must also address:

- a) actions taken, or being undertaken, by the holder of this environmental authority to ensure compliance with this environmental authority
- b) actions taken, or being undertaken, to prevent a recurrence of non-compliance.

A14 Where a condition of this environmental authority requires compliance with a standard, policy or guideline published externally to this environmental authority and the standard is amended or changed subsequent to the issue of this environmental authority the holder of this environmental authority must:

- a) comply with the amended or changed standard, policy or guideline within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, or where the amendment or change relates specifically to regulated structures referred to in condition **XX**, the time specified in that condition
- b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

How do I comply?

No further guidance provided to that outlined in the condition.

Schedule B - Air

Point source releases to air

B1 Discharges of contaminants to air from the activity, other than dust and particulate matter addressed by condition B4, must be in accordance with **Tables B1—release points (air)** and **B2—contaminant limits (air)**.

How do I comply?

The release of contaminants specified in condition should be:

- a) directed vertically upwards, with no impedence
- b) in accordance with the criteria in **Table B1—Release points (air)**
- c) at a mass emission rate and concentration that do not exceed the limits stated in **Table B2—Contaminant limits (air)**.

B2 Conduct a monitoring program of contaminant releases to the atmosphere at the release points, frequency and for the contaminants specified in **Table B2—Contaminant limits (air)** and which complies with the most recent edition of AS4323.1 'Stationary source emissions method 1: Selection of sampling positions' and the most recent edition of the administering authority's air quality sampling manual.

Table B1—Release points (air)

Table B2—Contaminant limits (air)

How do I comply?

A monitoring program of contaminant releases to the atmosphere at the release points, frequency and for the contaminants specified in **Table B2—Contaminant limits (air)** should be conducted to comply with the following:

- a) Monitoring at the release points should comply with the most recent edition of AS4323.1 Stationary source emissions method 1: Selection of sampling positions
- b) The following tests should be performed and recorded for each sample taken at each release point specified in **Table B1 - Point Source Air Emissions**
 - 1. gas velocity, volume and mass flow rate
 - 2. temperature
 - 3. water vapour concentration (for non-continuous sampling)
 - 4. the actual test methods and accuracy
- c) During the sampling period the following additional information should be gathered
 - 1. plant throughput rate at time of sampling
 - 2. fuel type and consumption rate
 - 3. any factors that may influenced odour and particular emissions
 - 4. the odour and/or particulates treatment system operating status
- d) Monitoring of contaminant release should be carried out in accordance with the most recent edition of the administering authority's air quality sampling manual.

B3 The release of point source and fugitive emissions from the mining activities must not cause the concentrations of the contaminants listed in **Table XX**, when measured at [\[a sensitive place or at specified monitoring stations\]](#), to exceed the levels shown in **Table XX**.

How do I comply?

No further guidance provided to that outlined in the condition.

- B4** The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the dust and particulate matter emissions generated by the mining activities do not cause exceedances of the following levels when measured at any sensitive or commercial place:
- a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method.
 - b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, for no more than 5 exceedances recorded each year, when monitored in accordance with the most recent version of either
 1. Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air Determination of suspended particulate matter – PM10 high volume sampler with size-selective inlet – Gravimetric method; or
 2. Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air Determination of suspended particulate matter – PM10 low volume sampler– Gravimetric method.
 - c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM2.5) suspended in the atmosphere of 25 micrograms per cubic metre over a 24 hour averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.10 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter – PM (sub)2.5(/sub) low volume sampler – Gravimetric method.
 - d) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method.

How do I comply?

Sources of PM2.5 are primarily from combustion sources and PM2.5 is unlikely to be elevated if significant combustion sources are not present. Condition B4 c) will therefore only be required if there is a significant source of air emissions from combustion sources.

The 5 exceedances allowed each year within in B4 b) are only permitted to allow for events that are known to occur, but which cannot be managed by the environmental authority holder. Such events could include emissions from bushfires, fuel reduction burning for fire management purposes or dust storms. More than 5 exceedances due to such events would not be considered to be in breach of B4 b) if the environmental authority holder can demonstrate that the exceedance was cause by such events outlined above.

Schedule C - Waste management

To achieve the outcomes of the waste management conditions section, the holder of this environmental authority should develop, implement and maintain a waste management program that should include:

- a) a description of the mining activities that may generate waste
- b) waste management control strategies including
 1. the types and amounts of wastes generated by the mining activities
 2. segregation of the wastes
 3. storage of the wastes
 4. transport of the wastes
 5. monitoring and reporting matters concerning the waste
- c) the hazardous characteristics of the wastes generated including disposal procedures for hazardous wastes
- d) a program for reusing, recycling or disposing of all wastes
- e) how the waste will be dealt with in accordance with the waste management hierarchy, including a description of the types and amounts of waste that will be dealt with under each of the waste management practices in the waste management hierarchy (that is, avoidance, reuse, recycling, energy recovery, disposal)
- f) procedures for identifying and implementing opportunities to minimise the amount of waste generated, promote efficiency in the use of resources and improve the waste management practices employed
- g) procedures for dealing with accidents, spills and other incidents
- h) details of any accredited management system employed, or planned to be employed, to deal with waste
- i) how often the performance of the waste management program will be assessed
- j) the indicators or other criteria on which the performance of the waste management program will be assessed
- k) staff training and induction to the waste management program.

General waste deposited in the active waste disposal trench should be compacted and covered with a layer of inert material following placement of the waste into the trench.

Litter control methods should be implemented at the active waste disposal trench.

The active waste disposal trench should be constructed and operated to minimise the generation of leachate including a system of diversion drains or embankments to divert surface waters away from any area where contact with wastes or sources of contamination may occur.

Completed waste disposal trenches should be capped with a low permeability material and compacted and contoured to effectively minimise water infiltration.

The holder of this environmental authority should maintain a record of the location of trenches used for waste disposal. Notwithstanding any other condition of this authority, such records be maintained until the administering authority approves the surrender of this authority.

All general and regulated waste (other than for example, waste rock, scraps, rejects, tailings, construction and demolition waste, putrescibles and domestic wastes, minor quantities of regulated wastes incidental to and commingled with domestic waste, green wastes, tyres) must be removed from the site to a facility that is lawfully able to accept the waste under the EP Act.

Regulated waste, other than that authorised to be disposed of on site under this authority, must only be removed and transported from the site by a person who holds a current authority to transport such wastes to a facility that is lawfully able to accept the waste under the EP Act.

Regulated waste generated in the mining activity can be temporarily stored on site awaiting removal provided it is stored to ensure there is minimal risk of causing fire or contamination to land or waters.

Each container of regulated waste stored awaiting movement off-site must be clearly marked to identify the contents.

For the disposal and storage of scrap tyres, reference to Operational policy—Disposal and storage of scrap tyres at mine sites EM729 should be made on the administering authority's website at www.ehp.qld.gov.au.

C1 General waste must only be disposed of into the waste disposal trench facility of <insert tenement number> and identified in Schedule # Figure # – Site Map.

How do I comply?

No further guidance provided other than that outlined in the condition.

C2 Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

How do I comply?

If it can be demonstrated that other possible options have been considered in accordance with the waste management hierarchy, burning may also be permitted for mining activities in addition to clearing for extraction activities.

C3 The holder of this environmental authority may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause environmental harm at any sensitive place or commercial place.

How do I comply?

No further guidance provided to that outlined in the condition.

Tailing disposal

- C4** Tailings must be managed in accordance with procedures contained within the current plan of operations. These procedures must include provisions for:
- a) containment of tailings
 - b) the management of seepage and leachates both during operation and the foreseeable future
 - c) the control of fugitive emissions to air
 - d) a program of progressive sampling and characterisation to identify acid producing potential and metal concentrations of tailings
 - e) maintaining records of the relative locations of any other waste stored within the tailings
 - f) rehabilitation strategy
 - g) monitoring of rehabilitation, research and/or trials to verify the requirements and methods for decommissioning and final rehabilitation of tailings, including the prevention and management of acid mine drainage, erosion minimisation and establishment of vegetation cover.

How do I comply?

No further guidance provided to that outlined in the condition.

Acid sulfate soils

- C5** Treat and manage acid sulphate soils in accordance with the latest edition of the Queensland Acid Sulfate Soil Technical Manual.

How do I comply?

No further guidance provided to that outlined in the condition.

Schedule D- Noise

Noise limits

- D1** The holder of this environmental authority must ensure that noise generated by the mining activities does not cause the criteria in **Table D1 – Noise limits** to be exceeded at a sensitive place or commercial place.

Table D1 – Noise limits

How do I comply?

The definition of 'sensitive place' and 'commercial place' is based on Schedule 1 of EPP Noise. That is, a sensitive place is inside or outside on a dwelling, library & educational institution, childcare or kindergarten, school or playground, hospital, surgery or other medical institution, commercial & retail activity, protected area or an area identified under a conservation plan under *Nature Conservation Act 1992* as a critical habitat or an area of major interest, marine park under *Marine Parks Act 2004*, park or garden that is outside of the mining lease and open to the public for the use other than for sport or organised entertainment. A commercial place is inside or outside a commercial or retail activity.

A mining camp (i.e., accommodation and ancillary facilities for mine employees or contractors or both, associated with the mine the subject of the environmental authority) is not a sensitive place for that mine or mining project, whether or not the mining camp is located within a mining tenement that is part of the mining project the subject of the environmental authority. For example, the mining camp might be located on neighbouring land owned or leased by the same company as one of the holders of the environmental authority for the mining project, or a related company. However, accommodation for mine employees or contractors is a sensitive place, even if the land is held by a mining company or related company, if occupation is not restricted to the employees, contractors and their families for the particular mine or mines which are held by the same company or a related company.

For example, a township (occupied by the mine employees, contractors and their families for multiple mines that are held by different companies) would be a sensitive place, even if part or all of the township is constructed on land owned by 1 or more of the companies.

Where there are 2 or more potential noise sources, it can be difficult to differentiate between them to determine if the mining activity is in exceedance of its noise limits. In these circumstances a site specific condition and monitoring requirements may need to be developed.

Noise is not considered to be a nuisance if monitoring demonstrates that noise from the activity does not exceed the limits outlined in **Table D1 – Noise limits** or equivalent site specific noise limit condition. It is recommended that if model condition A1, authorising of environmental harm, does not form part of the approval, than a similar condition be included within the adopted noise conditions.

Airblast overpressure nuisance

<p>D2 The holder of this environmental authority must ensure that blasting does not cause the limits for peak particle velocity and air blast overpressure in Table D2 – Blasting noise limits to be exceeded at a sensitive place or commercial place.</p>

Table D2 – Blasting noise limits

How do I comply?

No further guidance provided other than that outlined in the condition.

Monitoring and reporting

<p>D3 Noise monitoring and recording must include the following descriptor characteristics and matters:</p> <ul style="list-style-type: none">a) LAN,T (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins)b) background noise LA90c) the level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levelsd) atmospheric conditions including temperature, relative humidity and wind speed and directionse) effects due to any extraneous factors such as traffic noisef) location, date and time of monitoringg) if the complaint concerns low frequency noise, Max LpLIN,T and one third octave band measurements in dB(LIN) for centre frequencies in the 10 – 200 Hz range.
--

How do I comply?

The method of measurement and reporting of noise levels must comply with the latest edition of the administering authority's Noise Measurement Manual or the most recent version of AS1055 Acoustics – description and measurement of environmental noise. Where the conditions do not specify that noise limits are to be achieved at the boundary, monitoring can be undertaken at the noise sensitive place or the boundary. If the monitoring identifies exceedances of limits, monitoring at the noise sensitive place may however pose difficulties for the mining activity when trying to demonstrate that they are not the source of the noise when there are multiple noise sources.

Where the noise nuisance complaint relates to a sensitive place or commercial place that is less than 5 kilometres (5km) from the activity, monitoring will need to be undertaken for a period of at least 3 days.

For continuous/ongoing/multiple complaints originating at the same sensitive or commercial place, noise monitoring should be implemented such that exceedance of noise criteria outlined in **Table D1 – Noise limits** can be identified immediately. This may involve the implementation of real time directional noise monitoring stations. These monitoring stations should continuously monitor noise levels and the direction of that noise relative to the monitor. Procedures should be implemented such that the appropriate persons are notified immediately upon identification of noise limit exceedance.

- D4** The holder of this environmental authority must develop and implement a blast monitoring program to monitor compliance with **Table D2 – Blasting noise limits** for:
- a) at least <insert number> % of all blasts undertaken on this site in each <insert period e.g. month or year> at the nearest sensitive place or commercial place <at insert a place nominated in this authority>
 - b) all blasts conducted during any time period specified by the administering authority at the nearest sensitive place or commercial place.

How do I comply?

The method of measurement and reporting of vibration levels must comply with the most recent edition of the administering authority's guideline Noise and vibration from blasting guideline.

Where blast monitoring detects non-compliance with **Table D2 – Blasting noise limits** the holder of this environmental authority should:

- a) take steps to ensure compliance is achieved by subsequent blasts; and
- b) continue to monitor all consecutive blasts until at least 3 successive blasts comply with **Table D2 – Blasting noise limits**.

Schedule E - Groundwater

Contaminant release

E1 The holder of this environmental authority must not release contaminants to groundwater.
--

How do I comply?

This condition is only to be used when it has been identified that no release of contaminants to groundwater is to occur as a result of mining activities. The definition of a 'contaminant' is set out in Section 11 of the EP Act and relevantly includes any 'gas, liquid or solid', not just hazardous contaminants. For example, it would include the replenishment of aquifers with water of the same quality or higher quality than the aquifers. The term 'release' is defined in Schedule 4 of the EP Act and relevantly, it should be noted that this includes passive releases and not merely controlled releases. Accordingly, if it is likely that the activity will lead to the passive replenishment of aquifers, even with good quality water, this condition should not be used.

OR

E1 The holder of this environmental authority is authorised to release contaminants at the release points and at the release frequencies specified in Table E1 - Groundwater release points, frequency and comply with the release limits specified in Table E2 - Groundwater release quality .
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Table E1 - Groundwater release points, frequency

Table E2 - Groundwater release quality

How do I comply?

This condition is only to be used when it has been identified that release of contaminants to groundwater is authorised to occur as a result of mining activities.

Section 63 of the Environmental Protection Regulation 2008 addresses the topic of the release of 'waste' to groundwater. The term 'waste' is defined in Section 13 of the EP Act. Section 63 of the EP Regulation requires the administering authority to refuse an application if:

- (a) the waste is not being, or may not be, released entirely within a confined aquifer (except for petroleum activities); or
- (b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or
- (c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.

Paragraph (b) is not intended to apply to a surface ecological system which is authorised to be cleared for the purpose of the mining activities. Paragraphs (b) and (c) are not intended to apply to trivial impacts.

Where contaminants are proposed to be released to groundwater the limits set out in the condition must not be exceeded at the release point. All the potential contaminants generated as part of the mining activity that have a release limit will be included in this table. The limit type and value will need to be determined in consultation with the administering authority.

Monitoring and reporting

E2 All determinations of groundwater quality and biological monitoring must be performed by an appropriately qualified person.

How do I comply?

Monitoring methods should be in accordance with the latest edition of the Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on groundwater, and the Australian Governments Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat#6890.1). Analyses should be carried out on representative samples, at a laboratory accredited (for example, NATA) for the method of analysis being used.

E3 Groundwater quality and levels must be monitored at the locations and frequencies defined in **Table E3 - Groundwater monitoring locations and frequency** and **Schedule # – Figure #** (Groundwater Bore Monitoring Locations) for the quality characteristics identified in **Table E4 - Groundwater quality triggers and limits**.

Table E3 - Groundwater monitoring locations and frequency

Table E4 - Groundwater quality triggers and limits

How do I comply?

Monitoring locations must be suitably positioned to detect any impacts caused by the activity and ensure compliance with the conditions of the environmental authority.

Monitoring methods should be in accordance with the latest edition of the Queensland Monitoring and Sampling Manual, AS/NZS 5667:11 1998 Water Sampling Guidelines – Part 11 Guidance on groundwater, and the Australian Governments Groundwater Sampling and Analysis – A Field Guide (2009:27 GeoCat#6890.1)

Generic parameters and associated triggers and limits have not been provided given they would vary from site to site. This does not suggest though that any and every parameter should be included within this table. Only parameters that are relevant to groundwater quality associated with the activity should be included.

E4 Groundwater levels when measured at the monitoring locations specified in **Table E3 - Groundwater monitoring locations and frequency** must not exceed the groundwater level trigger change thresholds specified in **Table E5 - Groundwater level monitoring** below.

Table E5 - Groundwater level monitoring

How do I comply?

The level trigger thresholds will be site specific and dependent upon what type of aquifer is present. A 5 metre reduction in water level for consolidated aquifers such as sandstone or a 2 metre reduction in water level for unconsolidated aquifers such as shallow aquifers may be appropriate.

Depending upon site specifics, it could be possible that the level trigger threshold can be based on a percentage of annual average change of the aquifer rather than the 5 metre or 2 metre outline above.

Where there are localities that have known external influences on the fluctuation of groundwater levels, these should also be taken into account when setting the trigger level thresholds. This will avoid unnecessary investigations into exceedances being required by condition E6.

Exceedance Investigation

E5 If quality characteristics of groundwater from compliance bores identified in **Table E3 - Groundwater monitoring locations and frequency** exceed any of the trigger levels stated in **Table E4 - Groundwater quality triggers and limits** or exceed any of the groundwater level trigger threshold stated in **Table E5 - Groundwater level monitoring**, the holder of this environmental authority must compare the compliance monitoring bore results to the reference bore results and complete an investigation in accordance with the ANZECC and ARMCANZ 2000

How do I comply:

If the level of contaminants at the compliance monitoring bore does not exceed the reference bore results, then no action is to be taken. If however the level of contaminants at the compliance monitoring bore is greater than the reference bore results, an investigation is to be completed in accordance with the ANZECC and ARMCANZ 2000 into the potential for environmental harm and a written report is to be provided to the administering authority within 3 months, outlining:

- a) details of the investigations carried out
- b) details of environmental impacts observed
- c) actions taken to prevent environmental harm.

Where an exceedance of a trigger level has occurred and is being investigated, then no further reporting is required for subsequent trigger events for that quality characteristic within the 3 month investigation period.

E6 Results of monitoring of groundwater from compliance bores identified in **Table E3 - Groundwater monitoring locations and frequency**, must not exceed any of the limits defined in **Table E4 - Groundwater quality triggers and limits**.

How do I comply:

No further guidance provided other than that outlined in the condition.

Bore construction and maintenance and decommissioning.

E7 The construction, maintenance and management of groundwater bores (including groundwater monitoring bores) must be undertaken in a manner that prevents or minimises impacts to the environment and ensures the integrity of the bores to obtain accurate monitoring

How do I comply?

As a minimum, groundwater bores (including groundwater monitoring bores) must be constructed, maintained and decommissioned in accordance with methods prescribed in the latest edition of the National Uniform Drillers Licensing Committee manual titled Minimum Construction Requirements for Water Bores in Australia.

Oil-based drilling fluids, oil-based additives, synthetic based drilling fluids or synthetic based additives must not be used in the construction of groundwater bores.

Current Material Safety Data Sheets for all substances used for the drilling of groundwater bores must be made available to the administering authority promptly upon request.

Corrective measures must be taken immediately if the holder of this environmental authority becomes aware that bore construction, maintenance or decommissioning have resulted in a change in groundwater quality or groundwater levels or have caused interconnection of aquifers.

Schedule F – Water (Fitzroy model conditions)

Contaminant Release

F1 Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters as a result of the authorised mining activities, except as permitted under the conditions of this environmental authority.

F2 Unless otherwise permitted under the conditions of this environmental authority, the release of mine affected water to waters must only occur from the release points specified in **Table F1 - Mine affected water release points, sources and receiving waters** and depicted in Figure 1 attached to this environmental authority.

F3 The release of mine affected water to internal water management infrastructure installed and operated in accordance with a water management plan that complies with condition F28 is permitted.

How do I comply?

No further guidance to that outlined in the conditions and associated explanatory notes.

Table F1 - Mine affected water release points, sources and receiving waters

F4 The release of mine affected water to waters in accordance with condition F2 must not exceed the release limits stated in **Table F2 - Mine affected water release limits** when measured at the monitoring points specified in **Table F1 - Mine affected water release points, sources and receiving waters** for each quality characteristic.

Table F2 - Mine affected water release limits

F5 The release of mine affected water to waters from the release points must be monitored at the locations specified in **Table F1 - Mine affected water release points, sources and receiving waters** for each quality characteristic and at the frequency specified in **Table F2 - Mine affected water release limits** and **Table F3 - Release contaminant trigger investigation levels, potential contaminants**.

Note: the administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response in the event condition F5 is contravened due to a temporary lack of safe or practical access. The administering authority expects the environmental authority holder to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Table F3 - Release contaminant trigger investigation levels, potential contaminants

How do I comply?

No further guidance to that outlined in the conditions and associated explanatory notes.

- F6** If quality characteristics of the release exceed any of the trigger levels specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** during a release event, the environmental authority holder must compare the down-stream results in the receiving waters to the trigger values specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants** and:
- a) where the trigger values are not exceeded then no action is to be taken; or
 - b) where the down-stream results exceed the trigger values specified **Table F3 - Release contaminant trigger investigation levels, potential contaminants** for any quality characteristic, compare the results of the down-stream site to the data from background monitoring sites
 - 1. if the result is less than the background monitoring site data, then no action is to be taken; or
 - 2. 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 90 days of receiving the result , outlining
 - i. details of the investigations carried out
 - ii. actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F6 b (2) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

- F7** If an exceedance in accordance with condition F6 b (2) is identified, the holder of the environmental authority must notify the administering authority in writing within 24 hours of receiving the result.

How do I comply?

No further guidance provided to that outlined in the condition.

Mine Affected Water Release Events

- F8** The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in **Table F3 - Release contaminant trigger investigation levels, potential contaminants**.

- F9** Notwithstanding any other condition of this environmental authority, the release of mine affected water to waters in accordance with condition F2 must only take place during periods of natural flow in accordance with the receiving water flow criteria for discharge specified in **Table F4 - Mine affected water release during flow events** for the release point(s) specified in **Table F1 - Mine affected water release points, sources and receiving waters**.

F10 The release of mine affected water to waters in accordance with condition F2 must not exceed the Maximum Release Rate (for all combined release point flows) for each receiving water flow criterion for discharge specified in **Table F4 - Mine affected water release during flow events** when measured at the monitoring points specified in **Table F1 - Mine affected water release points, sources and receiving waters**.

or

F11 The 80th percentile of electrical conductivity (EC) values recorded at the downstream monitoring points listed in **Table F4 - Mine affected water release during flow events** must not exceed XXXuS/cm over the duration of the release influence period and have a maximum value of no greater than 20 per cent of XXXuS/cm. The 80th percentile must be calculated using all EC values recorded by the monitoring station during the release influence period.

Table F4 - Mine affected water release during flow events

How do I comply?

No further guidance to that outlined in the conditions and associated explanatory notes.

F12 The daily quantity of mine affected water released from each release point must be measured and recorded.

F13 Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

How do I comply?

No further guidance provided to that outlined in the condition.

Notification of Release Event

F14 The environmental authority holder must notify the administering authority as soon as practicable and no later than 24 hours after commencing to release mine affected water to the receiving environment. Notification must include the submission of written advice to the administering authority of the following information:

- a) release commencement date/time
- b) details regarding the compliance of the release with the conditions of Department Interest: Water of this environmental authority (that is, contaminant limits, natural flow, discharge volume)
- c) release point/s
- d) release rate
- e) release salinity
- f) receiving water/s including the natural flow rate.

Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local Administering Authority via email or facsimile.

F15 The environmental authority holder must notify the administering authority as soon as practicable and nominally no later than 24 hours after cessation of a release event of the cessation, of a release notified under Condition F14 and within 28 days provide the following information in writing:

- a) release cessation date/time
- b) natural flow rate in receiving water
- c) volume of water released
- d) details regarding the compliance of the release with the conditions of Department Interest: Water of this environmental authority (that is, contaminant limits, natural flow, discharge volume)
- e) all in-situ water quality monitoring results
- f) 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 F14 and F15, provided the relevant details of the release are included within the notification provided in accordance with conditions F14 and F15.

How do I comply?

The administering authority will take into consideration any extenuating circumstances prior to determining an appropriate enforcement response, in the event condition F14 is contravened due to extenuating circumstances, such as in emergencies which prevent communications, applicable monitoring equipment has been destroyed as a result of the emergency or access is prevented. The administering authority expects the environmental authority holder though to take all reasonable and practicable measures to maintain safe and practical access to designated monitoring locations.

Notification of Release Event Exceedance

F16 If the release limits defined in **Table F2 - Mine affected water release limits** are exceeded, the holder of the environmental authority must notify the administering authority within 24 hours of receiving the results.

How do I comply?

It should be noted however that a release which has exceeded release limits is no longer compliant and should cease. Any release that continues when limits in **Table F2 - Mine affected water release limits** have been breached will be subject to compliance action by the administering authority.

F17 The environmental authority holder must, within 28 days of a release that is not compliant with the conditions of this environmental authority, provide a report to the administering authority detailing:

- a) the reason for the release
- b) the location of the release
- c) the total volume of the release and which (if any) part of this volume was non-compliant
- d) the total duration of the release and which (if any) part of this period was non-compliant
- e) all water quality monitoring results (including all laboratory analyses)
- f) identification of any environmental harm as a result of the non compliance
- g) all calculations
- h) any other matters pertinent to the water release event.

Receiving Environment Monitoring and Contaminant Trigger Levels

F18 The quality of the receiving waters must be monitored at the locations specified in **Table F6 - Receiving water upstream background sites and down stream monitoring points** for each quality characteristic and at the monitoring frequency stated in **Table F5 - Receiving waters contaminant trigger levels**.

Table F5 - Receiving waters contaminant trigger levels

Table F6 - Receiving water upstream background sites and down stream monitoring points

How do I comply?

The intent is that that each discharge point has both an upstream and downstream monitoring point associated with it. These monitoring points should be located as close as practicable to the release point and the distances should be defined in the footnotes in **Table F6 - Receiving water upstream background sites and down stream monitoring points**. The location of flow monitoring points should also be considered in selecting upstream monitoring points. Other considerations include accessibility, particularly during wet weather conditions.

F19 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in **Table F5 - Receiving waters contaminant trigger levels** during a release event the environmental authority holder must compare the down stream results to the upstream results in the receiving waters and:

- a) where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or
- b) where the down stream results exceed the upstream results complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining
 1. details of the investigations carried out
 2. actions taken to prevent environmental harm.

Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with F19 b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

F20 All determinations of water quality and biological monitoring must be performed by an appropriately qualified person.

How do I comply?

All determinations of water quality and biological monitoring should be made in accordance with methods prescribed in the latest edition of the Department of Environment and Heritage Protection (or its successor) Monitoring and Sampling Manual. Samples should be collected from monitoring locations identified within this environmental authority. Analyses should be carried out on representative samples, at a laboratory accredited (for example, NATA) for the method of analysis being used.

Receiving Environment Monitoring Program (REMP)

F21 The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site. For the purposes of the REMP, the receiving environment is the waters of the XX and connected or surrounding waterways within XX (for example, Xkm) downstream of the release. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.

F22 A REMP Design Document that addresses the requirements of the REMP must be prepared and made available to the administrating authority upon request.

F23 A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the administrating authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

How do I comply?

The Receiving Environment Monitoring Program (REMP) should be used to assess the local receiving waters for the specified discharge locations. The monitoring should not be specifically designed to assess compliance of the release – this is covered by other conditions. The key purpose of the REMP is to assess the overall condition of the local receiving waters and assessment should be against water quality objectives and relevant guidelines.

Note that in some cases where discharge occurs to ephemeral streams, there may be a need to include downstream sensitive receiving waters or environmental values outside of the specified REMP area. An example of this would be where there are no semi-permanent /permanent waterholes in the specific area but 1 is located further downstream prior to the confluence with the next major waterway. For further guidance on what to include in a REMP, please refer to the Draft EHP REMP Document for Fitzroy Coal Mines and Additional Information. There is a potential for beneficial linkages of REMP monitoring to regional waterway monitoring programs, such as the Fitzroy Partnership monitoring program. For example EHP intends to maintain monitoring information compiled through individual REMP programs through an internal database under development. Industry has indicated its willingness to see this data shared with the Fitzroy Partnership for the purpose of a regional water monitoring program. Likewise it is possible for environmental authority holders to utilise relevant and available water monitoring information collected by other parties, such as the Fitzroy Partnership, as reference data for the purposes of the REMP required by this section.

The REMP should:

- a) assess the condition or state of receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (for example, seasonality)
- b) be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected
- c) include monitoring from background reference sites (for example, upstream or background) and downstream sites from the release (as a minimum, the locations specified in Table 6)
- d) specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the *Queensland Water Quality Guidelines 2006*. This should include monitoring during periods of natural flow irrespective of mine or other discharges
- e) include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in Table 2 and 3)
- f) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARM CANZ 2000, BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*)
- g) include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology
- h) apply procedures and/or guidelines from ANZECC & ARM CANZ 2000 and other relevant guideline documents
- i) describe sampling and analysis methods and quality assurance and control
- j) incorporate stream flow and hydrological information in the interpretations of water quality and biological data.

Water reuse

F24 Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party (with the consent of the third party).

How do I comply?

Note that the definition of 'wastewater' under the *Water Supply (Safety and Reliability) Act 2008* specifically exempts spent or used water generated from mining activities. In addition, there is an exemption from water service provider registration requirements if there is no charge for the water supply. Mines are encouraged to provide water to their neighbours and communities. Previous versions of these model water conditions specified terms to be included in agreements with those third parties, but current policy is that the commercial terms of these agreements, including the purposes for which the third parties require the water, are a matter for direct negotiation between the parties.

The provision of re-use water to artificial water storage structures, or direct application to land for purposes such as dust suppression in road maintenance and construction work, constitutes an authorised 'release' which does not need to be addressed under condition F2. However, as part of the annual review of water management plans, an outline should be included about beneficial re-use arrangements, for water balance purposes.

Annual Water Monitoring Reporting

- F25** The following information must be recorded in relation to all water monitoring required under the conditions of this environmental authority and submitted to the administering authority in the specified format:
- a) the date on which the sample was taken
 - b) the time at which the sample was taken
 - c) the monitoring point at which the sample was taken
 - d) the measured or estimated daily quantity of mine affected water released from all release points
 - e) the release flow rate at the time of sampling for each release point
 - f) the results of all monitoring and details of any exceedances of the conditions of this environmental authority
 - g) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

How do I comply?

No further guidance provided to that outlined in the condition.

Temporary Interference with waterways

- F26** Destroying native vegetation, excavating, or placing fill in a watercourse, lake or spring necessary for and associated with mining operations must be undertaken in accordance with Department of Natural Resources and Mines (or its successor) Guideline – Activities in a Watercourse, Lake or Spring associated with Mining Activities.

How do I comply?

No further guidance provided to that outlined in the condition.

Water Management Plan

F27 A Water Management Plan must be developed by an appropriately qualified person and implemented.

How do I comply?

The Water Management Plan should be developed in accordance with Department of Environment and Resource Management guideline *Preparation of water management plans for mining activities* and include:

- a) a study of the source of contaminants
- b) a water balance model for the site
- c) a water management system for the site
- d) measures to manage and prevent saline drainage
- e) measures to manage and prevent acid rock drainage
- f) contingency procedures for emergencies
- g) a program for monitoring and review of the effectiveness of the water management plan.

The Water Management Plan should be reviewed annually to assess the adequacy of the plan, ensure actual and potential environmental impacts are managed, and identify any necessary amendments to the plan.

Stormwater and Water sediment controls

F28 An Erosion and Sediment Control Plan must be developed by an appropriately qualified person and implemented for all stages of the mining activities on the site to minimise erosion and the release of sediment to receiving waters and contamination of stormwater.

F29 Stormwater, other than mine affected water, is permitted to be released to waters from:

- a) erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition F28
- b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with condition F27 for the purpose of ensuring water does not become mine affected water.

How do I comply?

Stormwater, other than mine affected water, is permitted to be released to waters from erosion and sediment control structures that are installed and operated in accordance with the Erosion and Sediment Control Plan required by condition F28. Stormwater is permitted to be released from water management infrastructure that is installed and operated in accordance with a Water Management Plan required by condition F27, for the purpose of ensuring water does not become mine affected.

The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.

Any spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters.

Schedule G- Sewage treatment

G1 The only contaminant permitted to be released to land is treated sewage effluent in compliance with the release limits stated in **Table G1 - contaminant release limits to land**.

Table G1 - Contaminant release limits to land

How do I comply?

F1 may need amendment if other contaminants are permitted to be released to land. Monthly monitoring of E coli may be revised based on location/remoteness of mine site.

G2 Treated sewage effluent may only be released to land in accordance with the conditions of this approval:

- a) within the nominated area(s) identified in [Schedule ## – Figure ##](#) (Sewage Treatment Plant and Effluent Disposal)
- b) on other land for the purpose of dust suppression and/or fire fighting.

How do I comply?

No further guidance provided to that outlined in the condition.

G3 The application of treated effluent to land must be carried out in a manner such that:

- a) vegetation is not damaged
- b) there is no surface ponding of effluent
- c) there is no run-off of effluent.

How do I comply?

No further guidance provided to that outlined in the condition.

G4 If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is present and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.

How do I comply?

No further guidance provided to that outlined in the condition.

G5 All sewage effluent released to land must be monitored at the frequency and for the parameters specified in **Table G1 - contaminant release limits to land**.

How do I comply?

No further guidance provided to that outlined in the condition.

G6 The daily volume of effluent release to land must be measured and records kept of the volumes of effluent released.

How do I comply?

No further guidance provided to that outlined in the condition.

G7 When circumstances prevent the irrigation or beneficial reuse of treated sewage effluent such as during or following rain events, waters must be directed to a wet weather storage or alternative measures must be taken to store/lawfully dispose of effluent.

How do I comply?

No further guidance provided to that outlined in the condition.

G8 A minimum area of <<insert area>> of land, excluding any necessary buffer zones, must be utilised for the irrigation and/or beneficial reuse of treated sewage effluent.

How do I comply?

No further guidance provided to that outlined in the condition.

G9 Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the Act whilst using the treated sewage effluent.

How do I comply?

The supply of treated wastewater for re-use is regulated under the *Water Supply (Safety and Reliability) Act 2008*.

Schedule H – Land and rehabilitation

H1 Land disturbed by mining must be rehabilitated in accordance with **Table H1 - Rehabilitation Requirements**.

Table H1 - Rehabilitation Requirements

How do I comply:

In addition to the criteria listed above, holders should be aware that section 276 of the *Mineral Resources Act 1989* includes a requirement that it is a condition of mining leases that: ‘the holder, prior to the termination of the mining lease for whatever cause, shall remove any building or structure purported to be erected under the authority of the mining lease and all mining equipment and plant, on or in the area of the mining lease unless otherwise approved by the Minister.’

There are occasions when the post-mining landholder wishes to retain specified mine infrastructure, such as roads, clean water dams, amenities and the like. It is not unusual for the mining lease holder to submit a copy of a written agreement with the landholder about these issues for the consent of the Minister administering the *Mineral Resources Act 1989*.

H2 Rehabilitation must commence progressively in accordance with the plan of operations.

How do I comply:

Rehabilitation must commence progressively as soon as areas become available and in accordance with the plan of operations. For more information, please refer to the most recent edition of the administering authority’s guideline rehabilitation requirements for mining projects (EM1122).

Contaminated Land

H3 Before applying for surrender of a mining lease, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the mining lease which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use under condition H1.

H4 Before applying for progressive rehabilitation certification for an area, the holder must (if applicable) provide to the administering authority a site investigation report under the Act, in relation to any part of the area the subject of the application which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use under condition H1.

How do I comply?

For more information, please refer to the most recent edition of the administering authority's guideline surrender applications and progressive rehabilitation.

H5 Minimise the potential for contamination of land by hazardous contaminants.

How do I comply?

The following activities have a risk of releasing dust fallout which can accumulate and be a source of contamination if not managed adequately, so care should be taken to manage these accordingly:

- a) crusher
- b) concentrate handling, storage and transport
- c) dry tailings
- d) transport of ore.

All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, flammable or combustible liquids and dangerous goods should be stored and handled in accordance with the current, relevant Australian Standard where such is applicable.

Notwithstanding the requirements of any applicable Australian Standard, any liquids stored on licensed place that have the potential to cause environmental harm should be stored and 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. The following could be applied:

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

All containment systems should be designed to minimise rainfall collection within the system.

Any spillage of hazardous contaminants should be cleaned up promptly. Dry methods of clean up are generally preferable to minimise the risk of release to land.

Biodiversity Offsets

- H6** The holder of this environmental authority must provide an offset for impacts on applicable state significant biodiversity values, in accordance with Queensland Biodiversity Offset Policy. The biodiversity offset must be consistent with the requirements for an offset as identified in the Biodiversity Offset Strategy (as per condition H7) and must be provided:
- a) prior to impacting on state significant biodiversity values; or
 - b) where a land based offset is to be provided, within 12 months of the later of either of the following
 - 1. the date of issue of this environmental authority; or
 - 2. the relevant stage identified in the Biodiversity Offset Strategy submitted under condition H7; or
 - c) where an offset payment is to be provided, within 4 months of the later of either of the following
 - 1. the date of issue of this environmental authority; or
 - 2. the relevant stage identified in the Biodiversity Offset Strategy submitted under conditions H7.

How do I comply?

No further guidance provided to that outlined in the condition.

- H7** A Biodiversity Offset Strategy must be developed and submitted to the administering authority within either 30 days, or a lesser period agreed to by the administering authority, prior to impacting on the applicable state significant biodiversity values.

How do I comply?

The Biodiversity Offset Strategy must include, as a minimum:

- a) demonstration that the activity has avoided or minimised impacts to applicable state significant biodiversity values
- b) where there will be impacts to applicable State significant biodiversity values, a detailed description of the values that will be impacted, and the extent of that impact
- c) mapping that details the surveyed locations of any applicable State significant biodiversity values at the licensed place
- d) results of a flora and fauna assessment of the affected area to determine if the operations will directly impact on any applicable State significant biodiversity values detailed in the *Queensland Biodiversity Offset Policy*
- e) project stages for the provision of offsets
- f) the proposed offset delivery mechanism for each stage
- g) where an offset transfer is proposed, or where a land based offset is to be secured within 12 months of commencement of the relevant stage, evidence that an offset can be located within the landscape
- h) an ecological equivalence assessment where required by the *Queensland Biodiversity Offset Policy*.

Guideline

Environmental Protection Act 1994

Structures which are dams or levees constructed as part of environmentally relevant activities

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Structures which are dams or levees constructed as part of environmentally relevant activities

1 Scope

This document provides information about the procedures of the administering authority when authorising structures which are dams, or levees that are constructed as part of an activity under an environmentally relevant activity (ERA) pursuant to the *Environmental Protection Act 1994*.

Environmental authorities and development approvals (both referred to hereafter as an 'authority') will include conditions that require holders of the authority to have the hazard category of any structures which are dams or levees that are constructed as part of a project assessed by a 'suitably qualified and experienced person'.

The hazard assessment will determine whether a structure is a 'regulated structure' for the purpose of the authority. Regulated structures will require certified design plans to be submitted to the administering authority, and will be subject to annual inspection and reporting by a suitably qualified and experienced person.

The responsibility for ensuring the accurate hazard assessment, documentation of the design, and the adequate performance of regulated structures rests with the holder of the authority and its consultants (i.e. the suitably qualified and experienced person).

The administering authority will rely on the certification(s) given by suitably qualified and experienced persons of documentation submitted to the administering authority. This places considerable onus on both the holder of the authority and the suitably qualified person(s) providing certification(s) to ensure that hazard assessments are rigorously carried out and that regulated structures are designed and operated in accordance with the regulatory requirements.

The administering authority may, from time to time, review documentation and certification(s) in detail for conformance with prevailing engineering and environmental management practices, and the provisions of the law.

2 Related document

This guideline relates to, and should be read in conjunction with, the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* (the manual) published by the administering authority.

The *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* does not limit, amend or change in any way, any other requirements to be complied with under authority conditions and/or regulations for the design and operation of a dam¹. Further, it does not negate any lawful requirements of the *Environmental Protection Act 1994*, other Commonwealth, state or local government laws or requirements under relevant standards or agreements.

3 Background

In the context of regulated structures which are dams or levees constructed as part of environmentally relevant activities; protecting human life and the environment requires that the standards used for the design, construction, operation, modification and decommissioning of regulated structures mitigate the hazards arising from potential failure or collapse of those structures.

¹ An example of other legislative requirements that may be relevant are those relating to referable dams under the *Water Supply (Safety and Reliability) Act 2008*.

Structures which are dams or levees constructed as part of environmentally relevant activities

The administering authority requires that any regulated structure be designed, constructed, operated and maintained to an engineering standard appropriate to the nature of the contents of the dam, the purpose for which it is to be used, and the environment in which it is located and will discharge. The administering authority also requires that the condition of regulated structures and their operations will be monitored on a regular basis, and that timely action will be taken to prevent or minimise any actual or potential environmental harm.

4 Essential elements of a design plan and certification for a regulated structure

A '**design plan**' is a document setting out how all identified hazard scenarios are addressed in the planned design and operation of a regulated structure. The document must describe the physical dimensions of the regulated structure, the materials and standards to be used for construction of the regulated structure, and the criteria to be used for operating the regulated structure.

The design plan must include all investigation and design reports, plans 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 regulated structure.

Documentation must be such that an independent review could be conducted without seeking further information from the designer.

A design plan for a regulated structure should address a range of issues including:

- the hazard scenarios that have been used in undertaking a hazard assessment;
- the hydrology/hydraulics used to estimate and deal with flood events, internal and external to the regulated structure, at probabilities appropriate to address identified hazard scenarios, including containment of contaminants;
- seepage and stability issues, including containment of contaminants; and
- any assumptions relating to the design and safety of the regulated structure.

A '**certification**' is required in the form set out in the attached Appendix A (and in the manual), from a suitably qualified and experienced person. The certification must be accompanied by a statement of reasons setting out how the facts documented in the design plan support the conclusion that the regulated structure is capable of providing the specific performance required of that structure.

4.1 Environmental objectives for regulated dams containing contaminants

Key performance objectives for regulated dams containing contaminants assessed as a hazard by a suitably qualified and experienced person, with the potential to cause environmental harm include that the contaminants are safely contained within the regulated dam during the operational life of that dam, and that upon decommissioning such contaminants are, either removed for safe disposal elsewhere, or securely encapsulated for the foreseeable future.

Flood protection levees are also to be classified as regulated structures as they have an important environmental objective of minimising the risk of excessive flood water inflows to a site on which an environmentally relevant activity is being conducted, and the consequent potential for contamination of the flood waters and overloading of containment performance.

Key performance criteria for design elements of regulated dams may be required for certain applications.

Structures which are dams or levees constructed as part of environmentally relevant activities

Regulated dams must be able to withstand seasonal rainfall events without releasing contaminants from the dam in an unauthorised manner. A minimum available storage, called a **design storage allowance** (DSA), is required to be estimated for regulated dams in accordance with the manual, in order to accommodate seasonal rainfall to a specified annual probability. On-site water management must allow for and provide the DSA volume in each regulated dam, going into each new wet season (that is, on the 1 November each year).

The intent of a DSA volume is to provide reasonable certainty that design performance criteria for containment will be met in any forthcoming wet-season. Failure to operate a regulated dam so that it meets the requirement to provide the DSA volume at the onset of each wet-season (that is, on the 1 November each year) should be an alert to the holder of an authority that it risks the likelihood that a spillway discharge from a regulated dam during the wet-season may not be authorised.

The intent of a **mandatory reporting level** (MRL) is to provide a level at which it is mandatory that the holder of an authority communicate to the administering authority that there is a possibility of a spillway discharge from a regulated dam.

Even where a regulated dam is designed and operated in compliance with the conditions of an authority and the certification provided, there may still be instances where there is associated spillway discharge during the wet season. If these requirements are met and the discharge meets the water quality conditions in the environmental authority (EA), it will be considered to be authorised. If water quality conditions in the environmental authority are exceeded, but all other requirements are met, then the operator may be able to demonstrate that they have met the general environmental duty which is a defence to a charge of environmental harm.

4.2 Environmental objectives for regulated dams—people and communities

Environmental harm includes physical and chemical risks to human life. In particular, this may occur where dams may have the potential—as a result of discharges—to chemically interfere with waters that may be used as sources of drinking water, or lives can be at risk due to dwellings or workplaces being in the path of a dam break flood.

These regulated dams must be designed, constructed, operated and decommissioned to mitigate those hazards. The taking of appropriate actions to mitigate hazards does not remove the responsibility of the holder of an authority to also mitigate consequences where it is practical and reasonable to do so.

Consultation with affected persons should occur prior to the construction of a dam which is assessed as being a high or significant hazard category. In situations where a hazard remains, consultation with affected persons must be undertaken by the holder, and emergency action plans, including response procedures, must be in place prior to operation of the regulated dam. For dams that are declared regulated structures after construction, consultation with affected persons must be undertaken by the holder, and emergency action plans, including response procedures, must be in place by a timeframe specified by a condition of the EA.

5 Applications for environmental authorities or development approvals that involve dams

Any application involving dams must include a copy of the most recent hazard assessment undertaken, with the accompanying certification.

Contemporary conditions applicable to regulated dams will be inserted by the administering authority in current authorities when amendment applications for projects involving dams are made, and in any application for a new authority.

Structures which are dams or levees constructed as part of environmentally relevant activities

Regulated dams that are authorised as part of resource activities that are not mining projects require details to be entered in a Register of Regulated Dams kept by the holder of the authority (the 'holder'), and an electronic copy provided annually to the administering authority². Details of all other regulated dams must be recorded on the relevant authority.

It is the responsibility of the holder of the authority to ensure any Register of Regulated Dams is accurately maintained.

5.1 Lodgement of design plans for regulated structures

Before operation of a regulated structure can commence, one paper copy and one electronic copy of a design plan, must be submitted to the administering authority.

5.2 Lodgement of annual inspection reports for regulated structures

Annual inspection reports on the condition and adequacy of any regulated structure must be made available to the administering authority on request.

To ensure that the administering authority is aware of the action to be taken by the holder of an authority as a result of the annual inspection report, the holder must, within 20 business days following receipt of the report, notify the administering authority of the findings of the report and the actions that are to be taken to implement the recommendations.

5.3 Form of certification

Any hazard assessment report, design plan or annual inspection report must be certified in accordance with the form of certification provided referenced in Appendix A to this guideline.

Disclaimer

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

Approved by:

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² A copy of the register template can be obtained by contacting the Department of Environment and Heritage Protection.

Structures which are dams or levees constructed as part of environmentally relevant activities

Appendix A

For Minimum requirements of certification/certification report and Form of certification (Hazard assessment/design plan), see: Appendix C of *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* constructed as part of environmentally relevant activities pursuant to the *Environmental Protection Act 1994 – Version 3*.

Appendix B—Model conditions schedule ‘X’ structures

General notes:

Explanatory notes for assessing officer guidance are in green. DELETE prior to issue of an authority.

Insertions required by applicants and/or the administering authority are in blue. DELETE appropriate parts or include relevant information prior to issue of an authority.

Model conditions are in black with defined terms indicated by **bold** text.

1. Preamble

The *Environmental Protection Act 1994* requires that any condition imposed be necessary or desirable to achieve the objects of the Act. In conditioning an environmental authority (authority), delegates should consider whether any condition, (model or otherwise) is necessary or desirable based on the particular facts and circumstances of the application to which the proposed authority relates. These model conditions have been prepared to indicate the administering authority’s position on and expectations of authority holders in managing potential environmental risk posed by structures which are dams or levees that are of a high or significant hazard category. They also allow for consistency in conditioning of authorities across the state. The conditions are able to be modified where evidence supplied indicates that such modification, removal or replacement would achieve the same objective and is deemed necessary or desirable by the delegate.

It is the departments’ position that the requirement for a condition to be ‘necessary or desirable’ has been met where a demonstrable link exists to achieving the object of the Act or discharging a duty or obligation imposed on the administering authority.

Officers should review the final conditions intended to be applied in a particular authority to ensure there is consistency in numbering, cross referencing and structure of conditions.

START OF CONDITIONS

2. Explanatory notes—all structures:

The model conditions under this section are expected to apply to all structures. Some parts of these model conditions are specific only to dams associated with a resource activity - non mining activity and this may affect the final structure and content of any particular authority.

The objective of the following conditions is to ensure that **all** structures are appropriately assessed to determine the applicable hazard category and a certificate provided by the suitably qualified and experienced person who undertook the assessment. Following this, appropriate conditioning can occur based on whether the structure is a regulated structure.

Where a structure is assessed as a low hazard structure, and later assessment results in the structure being determined to be a significant or high hazard category structure, this will require an amendment to the existing environmental authority or the Register of Regulated Dams.

Note that a dam includes all appurtenances that are connected with ensuring preservation of the integrity of the structure (e.g. spillways, catchment diversions). Also, a levee may be subject to regulation, depending on the consequences associated with failure as assessed in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the administering authority.

A hazard assessment report may include details in relation to more than one structure.

Assessment of hazard category

- (X 1) 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 (EM365)*; and
 - 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*.
 - (X 2) 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**.
 - (X 3) 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**.
 - (X 4) **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 (EM635)*.
 - (X 5) 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.
-

3. Explanatory notes—all regulated structures

The following model conditions relate to **all structures that have been assessed as regulated structures** (that is, structures in a high or significant hazard category).

Depending on the nature of the authority, some or all conditions may be applicable to the authority.

Regulated structures must not be constructed or operated unless an assessment of the hazard category, and a report and certification of the assessment has been prepared by a suitably qualified and experienced person.

A regulated structure must not be constructed or operated unless a suitably qualified and experienced person has prepared a design plan and certification for the regulated structure and this has been provided to the holder of the authority. Operation of the regulated structure is not permitted unless the holder has provided the administering authority with a copy of the design plan and certification.

The administering authority is not an approval body for the hazard category of a structure or design plans for a structure. Accordingly, acceptance by the administering authority of any report and certification (whether relating to the hazard category or design plan) does not indicate the administering authority approves the assessment carried out or the plans. The administering authority has set out requirements for suitably qualified and experienced persons to undertake this activity to ensure that the assessments and engineering works are conducted appropriately and in accordance with applicable standards.

Due to the number of dams associated with a resource activity - non mining activity, the administering authority has agreed to the use of a Register of Regulated Dams which is managed and maintained by the holder of an authority. For all other dams that are regulated dams, the details must be included in the authority itself.

Note that conditions X6 to X13 are not required if the proposal only covers existing structures that are declared regulated structures. In the case of existing structures that are declared to be regulated structures condition X39 must be included with transitional conditions X37 and X38.

If the project contains both new regulated structures and existing structures that are declared to be regulated structures after construction conditions X6 to X13 should contain the following 'excluding regulated structures listed in table X of condition X37.

Structures which are dams or levees constructed as part of environmentally relevant activities

Design and construction³ of a regulated structure

- (X 6) All **regulated structures** [excluding structures listed in condition X38] must be designed by, and **constructed**⁴ 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 (EM635)*.
- (X 7) **Construction** of a **regulated structure** [excluding structures listed in condition X38] 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**; and
 - 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**. [if appropriate insert reference to all conditions relating to X5 to X13 and if relevant, any conditions relating to design and construction that apply to dams associated with a resource activity - non mining activity (X33 to X35)]
- (X 8) 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 (EM635)*.
- (X 9) **Regulated structures** [excluding structures listed in condition X38] must:
- a) be designed and constructed in accordance with and conform to the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*;
 - b) be 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; and
 - ii) wall failure due to erosion by floodwaters arising from any **watercourse** or drainage line.
 - c) [Insert only in environmental authorities for regulated dams that are dams associated with a resource activity - non mining activity] have the floor and sides of the **dam** designed and constructed to prevent or minimise the passage of the wetting front and any entrained contaminants through either the floor or sides of the **dam** during the operational life of the **dam** and for any period of decommissioning and rehabilitation of the **dam**.
- (X 10) The design plan for a **regulated structure** [excluding structures listed in condition X38] 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; and
 - ii) addresses the requirements in X10(b) to (i)

³ Construction of a dam includes modification of an existing dam—refer to the definitions.

⁴ Certification of design and construction may be undertaken by different persons.

Structures which are dams or levees constructed as part of environmentally relevant activities

- 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; and
 - 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**; and
 - 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) [\[Insert only in environmental authorities for dams that are associated with a resource activity - non mining activity\]](#) A description of the containment system implemented.
 - f) 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**;
 - g) A plan for the decommissioning and rehabilitation of the regulated **structure** at the end of its operational life;
 - h) Details of reports on investigations and studies done in support of the design plan;
 - i) Any other matter required by the **suitably qualified and experienced person**.
- (X 11) **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;
- (X 12) 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**.

Structures which are dams or levees constructed as part of environmentally relevant activities

(X 13) The system design plan must contain:

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

Operation of a regulated structure

(X 14) 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 ##, and
 - ii) a set of 'as constructed' drawings and specifications, and
 - iii) **certification** of those 'as constructed drawings and specifications' in accordance with condition ##, and
 - 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; and
- c) [\[Insert only in environmental authorities for regulated dams that are dams associated with a resource activity - non mining activity\]](#) The **holder** has entered the details required under this **authority**, into a Register of Regulated Dams; **[OR]**
- d) [\[Insert only in authorities for regulated dams that are not dams associated with a resource activity - non mining activity\]](#) Relevant details for the **dam** have been included in Schedule X Table 1 and Schedule X Table 2 of this **authority**.

(X 15) 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.

(X 16) 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; and
- b) escape arrangements for trapped livestock and fauna.

4. Explanatory notes—all regulated structures (continued)

All regulated dams must have a clearly observable mandatory reporting level (determined in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)*). The holder must notify the administering authority on becoming aware of the dam contents reaching the MRL and take appropriate action to prevent or minimise the potential for environmental harm.

Each calendar year, an annual inspection and assessment of any regulated structure must be undertaken by a suitably qualified and experienced person, and a report prepared with recommendations for ensuring the integrity of the regulated structure is maintained. This inspection may indicate that the hazard category of a dam is potentially changed and identifies

Structures which are dams or levees constructed as part of environmentally relevant activities

amongst other things, whether there are any instances of failing to meet the conditions of an authority and the likelihood of insufficient capacity of a dam leading up to a wet season.

The holder of an authority must ensure there is sufficient capacity within the dam on 1 November of every year, to meet the design storage allowance (DSA) determined in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*. This is to minimise the risk of contaminants being released from the dam during a high rainfall wet season.

The intent of a DSA volume is to provide reasonable assurance that design performance criteria for containment will be met in any forthcoming wet-season. Failure to operate a regulated dam so that it meets the requirement to provide the DSA volume at the onset of each wet-season (that is, on the 1 November each year) should be an alert to the holder of an authority that it risks the likelihood that a spillway discharge from a regulated dam during the wet-season may not be authorised.

The intent of a mandatory reporting level (MRL) is to provide a level at which it is mandatory that the holder of an authority communicate to the administering authority that there is a possibility of a spillway discharge from a regulated dam.

Mandatory reporting level

- (X 17) 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.
- (X 18) The **holder** must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a **regulated dam** reaches the **MRL**⁵.
- (X 19) The **holder** must, immediately on becoming aware that the **MRL** has been reached, act to prevent the occurrence of any unauthorised discharge from the regulated dam.

Annual inspection report

- (X 20) Each **regulated structure** must be inspected each calendar year by a **suitably qualified and experienced person**.
- (X 21) 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.
- (X 22) 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**.

⁵ Please note that for some model conditions, such as model conditions for dams that are associated with a resource activity - non mining activity, the notification requirements may be located in a separate part of the conditions of an environmental authority (e.g. under notification requirement conditions).

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- (X 23) 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 (EM635)*.
- (X 24) 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; and
 - b) within twenty (20) 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**.
- (X 25) A copy of the annual inspection report must be provided to the administering authority upon request and within ten (10) business days⁶.

Design storage allowance

- (X 26) 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).
- (X 27) The **holder** must, as soon as possible and within forty-eight (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.
- (X 28) 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

- (X 29) 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.
- (X 30) 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

- (X 31) 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

- (X 32) Prior to the cessation of the environmentally relevant activity, each **regulated structure** must be decommissioned such that:

⁶ Please note that for some model conditions, such as model conditions for dams associated with a resource activity - non mining activity, the notification requirements may be located in a separate part of the conditions of an environmental authority (e.g. under notification requirement conditions).

Structures which are dams or levees constructed as part of environmentally relevant activities

1. ongoing environmental harm is minimised by the regulated structure:
 - i) becoming a safe site for humans and animals at the completion of rehabilitation; or
 - ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; or
 - iii) not allowing for acid mine drainage; 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 structure is compliant with all other relevant rehabilitation requirements of this authority⁷.

5. Explanatory notes—regulated structures other than dams associated with a resource activity - non mining activity

The following model conditions are intended to apply to all regulated structures (which are dams or levees) except for dams associated with a resource activity - non mining activity, which have separate additional model conditions set out later in this document. For regulated structures other than those which are dams associated with a resource activity - non mining activity, details of the regulated structure must be inserted into the authority itself. These details include location details of any regulated structure, details such as the hazard category, MRL and DSA and the hydraulic performance of the dam. Any change in these specifications will require an amendment to the authority or application for a transitional environmental plan (TEP).

These requirements are for new structures assessed as regulated structures, but may also apply to existing structures on amendment of an existing authority, or where an existing structure is being used under a new authority. In those instances only, transitional arrangements are able to be set out in the authority, providing for a transitional period within which the existing structure must be altered or modified to meet the new requirements. The term of three years is used as a benchmark only, and less time may be provided for, or alternatively a TEP may be applied for if more than three years is required.

Where the transitional arrangements provided for by X37 and X38 call up previous conditions of approval, the relevant schedule is to include the definitions that were applicable at the time that the conditions were imposed. Where there were no previous conditions of approval, the relevant schedule is to specify the applicable existing standards with which the regulated structure must comply.

Where a regulated structure ceases to be a regulated structure by being decommissioned and rehabilitated or having its hazard category re-assessed and certified by a suitably qualified and experienced person, an application may be made to amend the approval to remove the requirements in relation to that particular regulated structure.

Regulated structures location and performance

- (X 33) Each **regulated structure** named in Column 1, of Schedule D - Table 1 must be wholly located within the control points noted in columns 2 and 3 of Schedule D - Table 1, below, for that **structure**.

⁷ There may be additional specific conditions relating to rehabilitation and decommissioning that apply to a dam. Note it is possible to accept modification of condition X32 if a dam is accepted as an asset by a new landholder.

Structures which are dams or levees constructed as part of environmentally relevant activities

Schedule D—Table 1 (Location of Regulated structures)

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure ¹	Latitude ² (GDA 94)	Longitude ² (GDA 94)	Unique Location ID ³
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>

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

² 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 x10.

³ This location reference is the reference for schedule D table 4 flood level and crest level.

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(X 34) Each **regulated dam** named in column 1 of Schedule D—Table 2, must be consistent with the details noted in columns 2 through to and including 7 of Schedule D - Table 2, below, for that **dam**.

Schedule D—Table 2 (Basic Details of Regulated Dams)

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam ¹	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (m ³)	Max. depth of dam ² at spillway (m)	Spillway Level (mAHD)	Use of dam ³
<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>

¹ 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 Schedule D Table 1 for the dam.

² 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.

³ 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'.

(X 35) Each **regulated dam** named in column 1 of Schedule D – Table 1, must meet the **hydraulic performance** criteria noted in columns 2 through to and including 4 of Schedule D - Table 3, below, for that **dam**.

Schedule D—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
<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>

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(X 36) Each **regulated levee** named in column 1 of Schedule D – Table 1, must be consistent with the details noted in columns 2 through to and including 6 of Schedule D - Table 4, below, for that **levee**.

Schedule D—Table 4 (Basic Details of Regulated Levees)

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Name of Regulated Levee	Design AEP	Design Flood Level ¹ (mAHD)	Minimum Levee Level ¹ (mAHD)	Schedule D Table 1 Location ID ¹	Use of levee
<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>
<XXX>	<XXX>	<XXX>	<XXX>	<XXX>	<XXX>

¹ Design flood levels, and hence regulated levee levels, are expected to vary along the length of that levee. The location IDs listed (Column 5) must correspond with location IDs listed in Schedule D Table 1 and, together with Columns 3 and 4, define the minimum design level envelope for the longitudinal crest of the structure.

[Only insert the below model conditions into authorities for existing regulated dams that do not meet the requirements for basic details (Schedule D—Table 2) and hydraulic performance (Schedule D—Table 3), or if a levee (Schedule D—Table 4)]

Transitional arrangements

(X 37) Each **regulated structure** specified below must, within a period of three years (the transitional period) from [insert the date of the commencement of this condition], meet the performance requirements of conditions X34 and X35 or if a levee, condition X36:

- a) [<XXX>]; and
- b) [<XXX>].

(X 38) During the transitional period, each **regulated structure** specified in condition X37 must comply with either conditions X34 and X35 or if a levee, condition X36 of this **authority**, or the conditions set out in Schedule [<XXX>] of this **authority** which schedule expires at the end of the transitional period.

- (X 39) **During the transitional period**, for each declared regulated structure listed in condition X##, either:
- a) Certification must be provided, by a suitably qualified and experienced person, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*:
 - i) that the declared regulated structure is suitable for use as a regulated structure and can be transitioned to meet with either conditions X34 and X35 or if a levee, condition X36 of this **authority**; and
 - ii) of any design plans for the modification of the declared regulated structure where modification is required to meet with either conditions X34 and X35 or if a levee, condition X36 of this **authority**; or
 - b) The declared regulated structure must be decommissioned.

Structures which are dams or levees constructed as part of environmentally relevant activities

6. Explanatory notes—regulated dams that are dams associated with a resource activity – non mining

The below model conditions are only intended to apply to regulated dams that are dams associated with a resource activity - non mining activity.

The objective of these model conditions is to ensure the chances of any leaching, seepage or unintended release of Coal Seam Gas water, saline effluent or brine is minimised. The conditions also provide for a register of regulated dams to be developed and maintained by the holder of the authority rather than have details specified in the authority itself.

[Only insert the following conditions in environmental authorities for regulated dams that are associated with a resource activity – non mining]

(X 40) **Aggregation dams** must:

- a) have the floor and sides of the **dam** designed with material that will contain the wetting front and any entrained contaminants during the operational life of the **dam** and for any period of decommissioning and rehabilitation of the **dam**; and
- b) have a system to detect any passage of the wetting front or entrained contaminants through either the floor or sides of the **dam**; and

(X 41) **Brine dams** must:

- a) have the floor and sides of the **dam** designed with material that will contain the wetting front and any entrained contaminants during the operational life of the **dam** and for any period of decommissioning and rehabilitation of the **dam**; and
- b) have a system to detect any passage of the wetting front or entrained contaminants through either the floor or sides of the **dam**; and
- c) have a system for the collection and proper disposal of any contaminants that move beyond the bounds of the containment system; and
- d) that brine dams must be constructed with the capacity to continuously remove any leachate from beneath the floor or beyond the sides of the **dam**

[Only insert the following conditions in environmental authorities for regulated dams that are associated with a resource activity - non mining activity]

Register of Regulated Dams

- (X 42) A Register of Regulated Dams must be established and maintained by the **holder** and include, as a minimum, the following information for each **regulated dam**⁸:
- a) Date of entry in the register;
 - b) Name of the **dam**, its purpose and intended/actual contents;
 - c) Location of the **dam** defined by coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the **dam** including its storage area;
 - d) The **hazard category** of the **dam** as **assessed** using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)*;
 - e) Dates, names, and reference numbers of all document(s) lodged as part of a design plan for the **dam**;
 - f) Name and qualifications of the **suitably qualified and experienced person** who **certified** the design plan and 'as constructed' drawings;
 - g) For the **regulated dam**, other than in relation to any levees –
 - i) The **dimensions** (metres) and surface area (hectares) of the **dam** measured at the footprint of the **dam**;
 - ii) **Dam crest volume** (megalitres);
 - iii) Spillway crest level (metres AHD).
 - iv) Maximum operating level (metres AHD);
 - v) Storage rating table of stored volume versus level (metres AHD);
 - vi) **Design storage allowance** (megalitres) and associated level of the dam (metres AHD);
 - vii) **Mandatory reporting level** (metres AHD);
 - h) The design plan title and reference relevant to the **dam**;
 - i) The date **construction** was **certified** as compliant with the design plan;
 - j) The name and details of the **suitably qualified and experienced person** who **certified** that the constructed **dam** was compliant with the design plan;
 - k) Details of the composition and construction of any liner;
 - l) The system for the detection of any leakage through the floor and sides of the **dam**;
 - m) Dates when the regulated **dam** underwent an annual inspection for structural and operational adequacy, and to ascertain the available storage volume for 1 November of any year;
 - n) Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;
 - o) Dam water quality as obtained from monitoring required under this **authority** as at 1 November of each year.
- (X 43) The **holder** must provisionally enter the required information in the Register of Regulated Dams when a **design plan** for a **regulated dam** is submitted to the administering authority.
- (X 44) The **holder** must make a final entry of the required information in the Register of Regulated Dams once compliance with condition (X14) has been achieved.

⁸ Note: The regulated dam register in the approved departmental format is available for download at: www.ehp.qld.gov.au/management/coal-seam-gas/csg-water.html.

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- (X 45) The **holder** must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.
- (X 46) All entries in the Register of Regulated Dams must be approved by the chief executive officer for the holder of this authority, or their delegate, as being accurate and correct.
- (X 47) The **holder** must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Dams, in the electronic format required by the administering authority.

[Only insert the following conditions in environmental authorities for regulated dams that are associated with a resource activity - non mining activity]

Repair requirements

- (X 48) Where the **holder** detects any passage of the wetting front through the floor or sides of a **regulated dam** they must, as soon as practicable:
- repair the regulated **dam** to rectify the detected passage of the wetting front or entrained contaminants through the floor or sides of the regulated **dam**; or
 - decommission and rehabilitate the regulated **dam**.

Definitions

Aggregation dam means a regulated dam that receives and contains coal seam gas water or coal seam gas concentrate. The primary purpose of the dam must not be to evaporate the water even though this will naturally occur.

Annual exceedance probability or AEP the probability that at least one event in excess of a particular magnitude will occur in any given year.

Assessed and assessment by a suitably qualified and experienced person in relation to a hazard assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit of the assessment:

- exactly what has been assessed and the precise nature of that determination;
- the relevant legislative, regulatory and technical criteria on which the assessment has been based;
- the relevant data and facts on which the assessment has been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
- the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

Associated works in relation to a dam, means:

- operations of any kind and all things constructed, erected or installed for that dam; and
- any land used for those operations.

Authority means an environmental authority or a development approval.

Brine means saline water with a total dissolved solid concentration greater than 40,000 mg/L.

Brine dam means a regulated dam that is designed to receive, contain or evaporate brine.

Certification means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by this manual, including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated

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Structures which are dams or levees constructed as part of environmentally relevant activities

structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).

Certifying, certify or certified have a corresponding meaning as 'certification'.

Construction or constructed in relation to a dam includes building a new dam and modifying or lifting an existing dam, but does not include investigations and testing necessary for the purpose of preparing a design plan.

Coal seam gas water means groundwater that is necessarily or unavoidably brought to the surface in the process of coal seam gas exploration or production. Coal seam gas water typically contains significant concentrations of salts, has a high sodium adsorption ratio and may contain other contaminants that have the potential to cause environmental harm if released to land or **waters** through inappropriate management. Coal seam gas water is a waste, as defined under s. 13 of the *Environmental Protection Act 1994*.

Coal seam gas water concentrate means the concentrated saline water waste stream from a water treatment process that does not exceed a total dissolved solid concentration of 40 000 mg/L.

Coal seam gas evaporation dam is defined as a impoundment, enclosure or structure that is designed to be used to hold coal seam gas water for evaporation.

Dam means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and **associated works**. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

Dam crest volume means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (eg via spillway).

Design storage allowance or DSA means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* published by the administering authority, must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that manual.

Designer for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

Development approval means a development approval under the *Integrated Planning Act 1997* or the *Sustainable Planning Act 2009* in relation to a matter that involves an environmentally relevant activity under the *Environmental Protection Act 1994*.

Emergency action plan means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure, and ensure timely warning to downstream communities and the implementation of protection measures. The plan must require dam owners to annually update contact details that are part of the plan, and to comprehensively review the plan at least every five years.

[Only insert the following definitions in authorities for regulated dams [that are associated with a resource activity - non mining activity](#)]

Existing aggregation dam means <INSERT names and locations of aggregation dams that are constructed and/or whose construction had substantially commenced on the approval date of this environmental authority>.

Existing brine dam means <INSERT names and locations of brine dams that are constructed and/or whose construction had substantially commenced on the approval date of this environmental authority>.

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Existing coal seam gas evaporation dam means <INSERT names and locations of existing dams containing coal seam gas water for the primary purpose of evaporation that are constructed and/or whose construction had substantially commenced on the approval date of this environmental authority>.

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.

Hazard in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

Hazard category means a category, either low, significant or high, into which a dam is assessed as a result of the application of tables and other criteria in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)*.

Holder means:

- (a) where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or
- (b) where this document is a development approval, any person who is the registered operator for that development approval.

Hydraulic performance means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)*.

Levee means an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of **water** or **flowable substances** at any other times.

Low hazard dam means any dam that is not a high or significant hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)*; and

Mandatory reporting level or MRL means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* published by the administering authority.

Modification or modifying (see definition of 'construction')

Operational plan for a dam means a document that amongst other things sets out procedures and criteria to be used for operating a dam during a particular time period. The operational plan as defined herein may form part of a plan of operations or plan otherwise required in legislation.

Regulated dam means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams (EM635)* published by the administering authority.

Structure means dam or levee.

Spillway means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges from the dam, normally under flood conditions or in anticipation of flood conditions.

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Suitably qualified and experienced person in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience:

- for regulated dams, an RPEQ who is a civil engineer with the required qualifications in dam safety and dam design.
- for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments.

Note: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.

System design plan means a plan that manages an integrated containment system that shares the required DSA volume across the integrated containment system.

Void means any constructed, open excavation in the ground.

Watercourse has the same meaning given in the *Water Act 2000*.

Waters includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater.

Water year means the 12-month period from 1 July to 30 June.

Wet season means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.