

New Acland Coal Mine Stage 3 project

Coordinator-General's evaluation report on the environmental impact statement

December 2014

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Synopsis

This report evaluates the potential impacts of the New Acland Coal Mine Stage 3 project (the project). It has been prepared in accordance with Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

New Acland Coal Pty Ltd, the project proponent, prepared an environmental impact statement (EIS) for the project, which is located 160 kilometres (km) west of Brisbane, 35km north-west of Toowoomba, and 14km north-west of the town of Oakey.

The project includes expansion of the existing open-cut New Acland Coal mine and construction of associated infrastructure, including an 8km rail spur linking to the existing West Moreton rail line. The expansion of the mine would produce up to 7.5 million tonnes per annum (Mtpa) of thermal coal until the year 2029.

The existing mine is a 5.2Mtpa open-cut coal mine on mining leases 50170 and 50216, granted under the approval of Environmental Authority (EA) EPML00335713. Most of the stage 3 expansion will be located on mining lease application (MLA) 50232.

The proponent has applied to amend its existing EA to include the MLA area. For the rail spur, the proponent has lodged an application for an infrastructure mining lease (MLA (infrastructure) 700001).

The project will require an estimated \$900 million of capital investment. Operational expenditure is expected to total around \$5.74 billion over the life of the project. The project is expected to create around 260 jobs during construction and 435 jobs during operations.

In evaluating the project, I have considered the EIS documentation, the additional information to the EIS (AEIS), issues raised in submissions during public consultation on the EIS and AEIS, information and advice I have received from advisory agencies and the Independent Expert Scientific Committee, and the proponent's responses to questions.

The following provides an overview of the main issues considered in my evaluation.

Matters of state environmental significance

The project will require clearing of eight endangered and of-concern regional ecosystems totalling 84 hectares (ha), 70.8ha for one flora species (Belson's panic grass) and 19.5ha of habitat for the koala—matters of state environmental significance (MSES) under Queensland legislation.

To reduce impacts on MSES, I have set conditions that limit the amount of vegetation to be cleared, for the proponent to provide offsets for significant residual impacts, and the requirement for a koala species management plan to be implemented. Residual impacts on Belson's panic grass will be offset under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

I have also set conditions that pre-clearance flora and fauna surveys are required before construction.

The proponent has committed to not divert Lagoon Creek, which dissects the project site, and to rehabilitate a 50 metre (m) conservation buffer either side of the high bank. Although currently degraded, the riparian zone of Lagoon Creek contains some remnant vegetation which provides habitat for koalas and a nature corridor and refuge for other fauna species. I have conditioned the proponent to deliver a Conservation Zone Management Plan, which includes a requirement to meet rehabilitation targets set by the Queensland Herbarium in order to restore a functioning regional ecosystem within the conservation zone.

For the clearing of listed species, I have set a condition requiring the proponent to prepare an environmental offsets strategy. The strategy must detail requirements for the provision of offsets.

I am satisfied that these measures can minimise risks to flora and fauna and, where any significant residual impacts remain, that values can be offset.

Land use and rehabilitation

The total mining lease area for MLA50232 has been reduced from 5,069ha for the original stage 3 project to 3,668ha, a 28 per cent reduction; with the proponent also abandoning the mining lease area over the town of Acland.

The disturbance footprint for the stage 3 project on MLA50232, which includes pits, slope batters, out-of-pit dumps and infrastructure, is 1,466ha, a 60 per cent reduction from what was originally proposed.

Around 1,361ha of strategic cropping land would be affected by the project works; representing a 63 per cent reduction. The proponent proposes to return the majority of the land to grazing. The proponent currently runs cattle on rehabilitated land from its existing operation, with grazing trials underway to inform improvements to the management of rehabilitated land.

I have conditioned detailed requirements for pre-mining soil surveys, to confirm the values of land to be disturbed. I have also conditioned that the rehabilitation of affected land must be able to support the best post-disturbance land use possible. The rehabilitated land has to meet set success criteria on matters such as soil attributes, plant density, yield of harvestable material, and botanical composition.

The proponent has committed to infilling around two-thirds of mined areas, with final voids estimated to total around 457ha. I have set benchmark conditions that land equivalent to that which would be lost due to permanent mine voids is to be secured, and its agricultural values improved and managed until the mining lease is surrendered.

The project will be subject to future assessment under the *Regional Planning Interests Act 2014* prior to construction.

Noise, vibration and air quality

To reduce disturbance, nuisance and health impacts from noise, vibration and dust,

the project must adhere to strict standards for noise, vibration and air quality at homesteads near the project.

The proponent has committed to the use of real-time air and noise monitoring equipment that will issue warnings if limits are close to being exceeded. Mining operations will then be modified, or ceased, if limits cannot be met. I have conditioned the requirement for real-time dust monitoring, and have required the establishment of additional monitoring sites.

All potential noise, vibration and dust impacts must be managed in accordance with the proponent's draft environmental management plan (EM Plan), and my conditions which set limits on these matters. In addition, I have conditioned that monthly public reporting of all air, noise and vibration monitoring results is to occur.

I am satisfied that the proponent's draft EM Plan, commitments and conditions I have set will adequately mitigate and manage potential noise, vibration and air impacts.

Traffic and transport impacts

The project will generate additional traffic on state-controlled and local roads, which will require upgrades to a number of intersections and level crossings. I have conditioned the proponent to upgrade impacted intersections and construct a new site access intersection in order to maintain levels of service on the road network. My conditions further require the proponent to obtain approval from the Department of Transport and Main Roads and Toowoomba Regional Council for all required road works and improvements, prior to construction commencing.

Additional travel distances will be incurred by some residents travelling from Jondaryan to Acland and beyond due to the project's proposed road closures and a diversion. To mitigate this, I have set a condition that requires a new access to be created and sealed.

Rail movements from the project will increase from the current 53 trains per week to up to 80. However, the total number of trains along the West Moreton line will not increase in the short term because of other demands reducing, therefore current network efficiencies will be maintained. In the long term, upgrades to the West Moreton rail system will be needed, with rail users to negotiate such requirements with Aurizon.

Jondaryan Rail Load-out Facility

In response to concerns raised by the local community through the EIS process about noise and dust from the mine's existing Jondaryan Rail Load-out Facility (JRLF), located 1km from the town of Jondaryan, the proponent proposes to construct a new train load-out facility (TLF) on the mine site, 8km north of Jondaryan, and decommission the JRLF.

To ensure this occurs, I have set a condition that the new TLF will be the sole distribution point for all railed product produced by the project, from the day of first operations of stage 3.

Economic and social impacts

The project will boost regional and state economies, with capital expenditure expected to be \$900 million over the project life. The project would create up to 260 construction jobs and 435 operational jobs.

A social impact assessment conducted for the project focused on community and stakeholder engagement, health and community wellbeing, housing and accommodation, local business and industry content, and workforce management. Action plans have been developed to address the potential social and economic impacts.

The proponent has committed to the following actions to avoid, mitigate or manage adverse social impacts and maximise positive opportunities:

- investigating all community concerns promptly and appropriately to reduce impacts
- implementing the Acland Management Plan to enable the community to be part of the decision-making process
- maximising local employment during construction and operation to reduce the impact on the local housing market
- implementing strategies to build capacity for local service providers and businesses
- implementing equal employment opportunities
- providing structured training programs, including apprenticeships and traineeships.

The proponent expects that the construction workforce will be made up of local residents near the mine and Toowoomba and workers from the broader South East Queensland region. The proponent has committed that its focus will be on recruiting local and regional workers where possible.

The proponent has committed to implement the action plans throughout the life of the project and work with stakeholders to effectively manage social impacts.

Matters of national environmental significance

Threatened ecological communities and flora

The project will result in the clearing of up to 24.6ha of brigalow and 40.1ha of bluegrass-dominant grasslands, both listed under the EPBC Act as endangered threatened ecological communities (TECs). In addition, up to 70.8ha of Belson's panic grass, listed as vulnerable, will be impacted.

The proponent has proposed to secure offsets for both TECs, with land owned by the proponent available for the bluegrass offset. A threatened species translocation plan has been proposed by the proponent to manage relocating, enhancing and maintaining Belson's panic at new sites owned by the proponent.

I have recommended conditions to the Commonwealth Minister for the Environment requiring the preparation of a bluegrass offset management plan, and the improvement, management and ongoing maintenance of the bluegrass offsets sites. I have further recommended conditions stating that offsets for any significant residual

impact on 135.5ha of vegetation are required for the three threatened flora. I have also conditioned maximum disturbance limits for threatened flora and TECs.

For matters of national environmental significance (MNES) that may be indirectly impacted by project works, I have recommended a condition that the proponent prepare an MNES management plan (MMP) detailing how threatened species are to be managed to protect environmental values. The MMP includes the requirement for pre-clearance surveys for MNES, with any new finds to be confirmed with the Commonwealth Department of the Environment (DE). The MMP is required to propose how any newly discovered species are to be managed, and to seek advice from DE. The management strategies are to be approved as part of the MMP.

Surface water

I have set conditions that the proponent is not to contaminate groundwater or surface water due to the project's actions. My conditions set requirements on the design and maintenance of dams to ensure structural integrity during high rainfall periods. Further conditions apply to the treatment and discharge of mine water stored onsite that set release limits and water quality requirements that must be met before a release can occur.

Groundwater impacts

Groundwater is used for stock watering, cropping and human consumption in the project area. The proponent's modelling predicts that at the end of mining the project may affect four aquifers. The largest impact is anticipated to be on the Walloon Coal Measures, a brackish system where drawdown at the project site may be up to 47m. Beyond the project site, the drawdown contour of around 1m in depth may extend across an area of around 21km in diameter.

Within the area of drawdown in and around the mining area, 357 registered bores may be affected. I have set conditions requiring the proponent to enter into make-good agreements with potentially affected groundwater users. Make-good agreements could include providing an alternative water supply should groundwater supplies be impacted by the project.

I have further set conditions that require offsets for water lost due to groundwater drawdown effects of the project. These offsets apply to groundwater of sufficient quality to be used for the environment and communities. The proponent will also be required to develop and implement a robust groundwater monitoring, iterative modelling and management program during the life of the project which will determine the final offset requirements, as well as providing increased certainty on the scale and timing of impact on registered boreholders.

Flooding

The 8km rail spur will be built in the catchment's floodplain, therefore I have set conditions that require independent certification of the design and construction of the infrastructure. Certification is required to confirm the rail spur would not increase flood damage at domestic or commercial premises when considering a high-flow event such

as a 1-in-50-year annual recurrence interval event. Design standards have been conditioned to ensure the spur does not materially alter current water flow conditions.

Environmental management plan

The proponent must manage the impacts of the project in accordance with my conditions and recommendations, the project's draft EM Plan and the proponent's commitments. I require the proponent to fully implement the commitments detailed in the proponent's commitment register.

The draft EM Plan for the mine site has been prepared by the proponent and contains a number of specific sub-plans addressing matters such as dust emissions, water management and rehabilitation. The draft EM Plan will need to be approved under the EP Act before a final EA can be issued.

Coordinator-General's conclusion

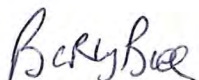
I consider that the environmental impact assessment requirements of the SDPWO Act for the New Acland Coal Mine Stage 3 project have been met and that sufficient information has been provided to enable a thorough evaluation of the potential impacts of the project.

I conclude that there are significant local, regional and state benefits to be derived from the development, and that any adverse environmental impacts can be acceptably avoided, minimised, mitigated or offset through the implementation of the measures and commitments outlined in the EIS documentation. The conditions I have specified in this report have been formulated in order to further manage the predicted impacts associated with the project.

Accordingly, I approve the project to proceed subject to the conditions and recommendations set out in the appendices of this report and the proponent obtaining all subsequent statutory approvals. In addition, I require the proponent's commitments to be implemented in full.

This report will be provided to the Commonwealth Minister for the Environment, in accordance with section 36(2) of the SDPWO Regulation and the bilateral agreement between the State of Queensland and the Australian Government, to support a decision on the controlled action for this project in accordance with section 133 of the EPBC Act.

A copy of this report will be provided to the proponent, Toowoomba Regional Council and relevant state government agencies. This report will also be publicly available at www.dsdip.qld.gov.au



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Barry Broe
Coordinator-General
December 2014

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1. Introduction

This report has been prepared in accordance with Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and provides an evaluation of the environmental impact statement (EIS) for the New Acland Coal Mine Stage 3 project (the project). The report:

- summarises the key issues associated with the potential impacts of the project on the physical, social and economic environments at the local, regional, state, and where relevant, national levels
- presents the findings of my evaluation of the project based on information including the EIS, additional information on the EIS (AEIS), responses to information requests, submissions made on the EIS and AEIS documents, and information and advice from advisory agencies and the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC)
- states and imposes conditions and makes recommendations under which the project may proceed.

2. About the project

2.1 Project proponent

The proponent for the project is New Acland Coal Pty Ltd (the proponent), a subsidiary of New Hope Corporation Limited, which is an Australian company. Both the proponent and New Hope Corporation Limited are part of the New Hope Group.

The proponent has operated the existing New Acland Coal (NAC) mine since 2002. The NAC mine is a 5.2 million tonnes per annum (Mtpa) open cut coal mine on mining lease 50170 and mining lease 50216, under the approval of Environmental Authority (EA) EPML00335713.

2.2 Project description

The project is located around 160 kilometres (km) west of Brisbane, 35km north-west of Toowoomba, and 14km north-west of the town of Oakey.

The New Acland Stage 3 project proposes expansion of the existing open-cut NAC mine to produce up to 7.5Mtpa of thermal coal until the year 2029, or an approximately 12 year period depending on when construction commences.

Figure 2.1 shows the location of the project.

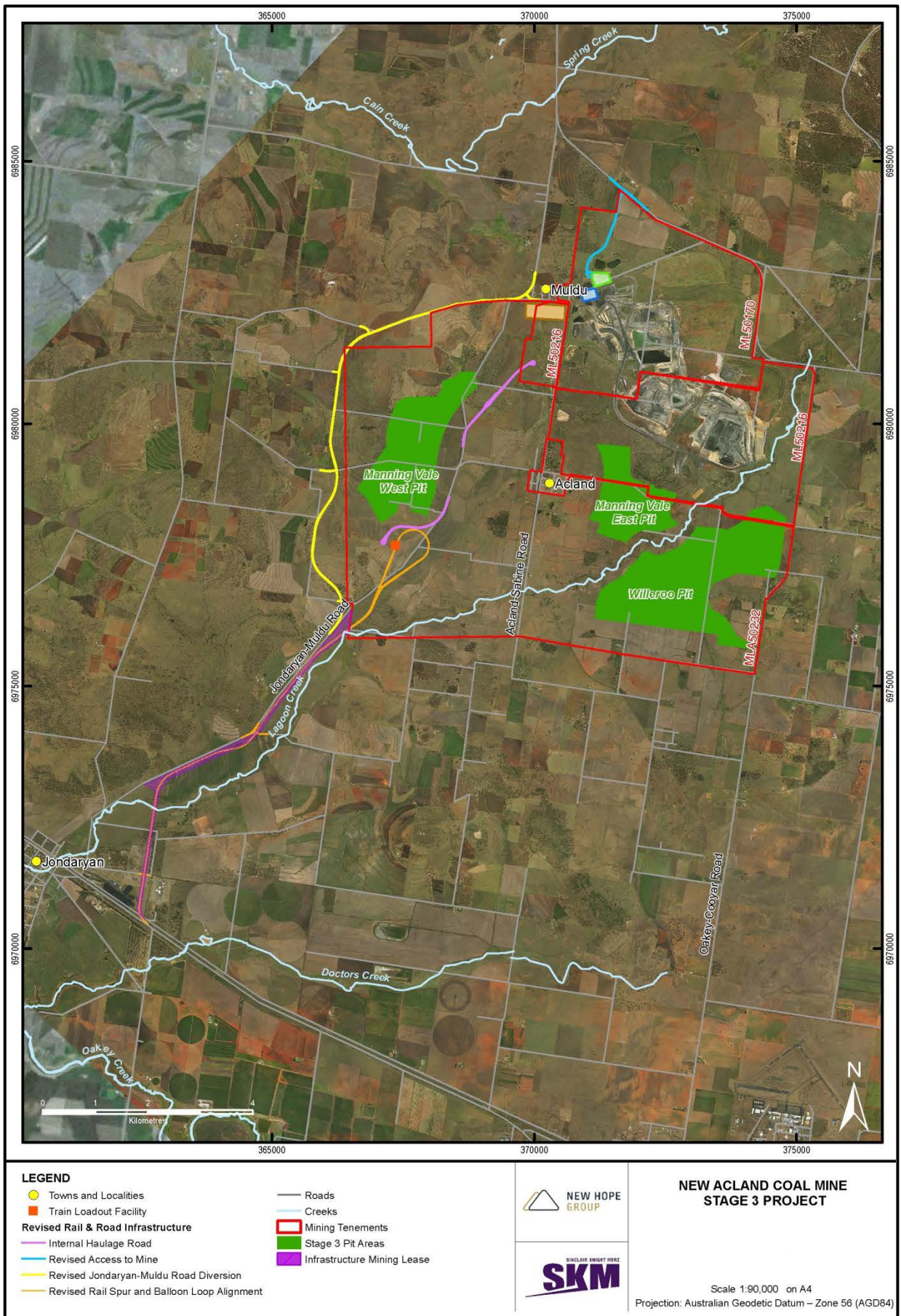


Figure 2.1 New Acland Coal Mine Stage 3 project

2.2.1 Project components

The key components of the project include:

- mining in three new pits, namely, the Manning Vale West, Manning Vale East and Willeroo pits
- mining and out-of-pit dumps located on mining lease 50216
- emplacement of two out-of-pit spoil dumps associated with the Manning Vale and Willeroo mine pits
- construction of a new eight kilometre-long rail spur line and balloon loop on mining lease application (MLA) (infrastructure) 700001 from Jondaryan onto MLA50232
- construction of the Train Load-out Facility (TLF) within MLA50232
- construction of a Materials Handling Facility (MHF) on mining lease 50216
- upgrade of the existing Coal Handling Preparation Plant (CHPP) complex, ROM and product coal stockpile areas and supporting infrastructure on mining lease 50170
- relocation and potential upgrade of the current power supply for the mine operation and the local 11kV distribution system
- decommissioning of the existing mine's Jondaryan Rail Load-out Facility (JRLF)
- relocation and potential upgrade of the existing local telecommunication network.

The project's disturbance footprint will total around 1,466 hectares (ha). Within this, the three open-cut areas will equate to around 1,201ha. The final voids will total around 457ha, have depths ranging between 60–80 metres (m) and be profiled with slopes from 8 to 19 degrees.

Project infrastructure

Associated mine infrastructure for the project includes the use or upgrade of existing infrastructure, and new infrastructure. The project's rail corridor will be located on MLA (infrastructure) 700001.

Essential infrastructure required for the project includes:

- diversion of the Jondaryan-Muldu Road around the intended Manning Vale West resource area
- decommissioning of the existing JRLF
- construction of a new eight kilometre-long rail spur line and balloon loop from Jondaryan on to the southern portion of the mining lease
- construction of a new MHF and TLF
- water management structures and additional supporting infrastructure
- upgrading the existing CHPP precinct, including run of mine (ROM) and product coal stockpile areas ROM 1 and ROM 2
- upgrades to supporting infrastructure for 180 tonne haul trucks
- continued use of tailings disposal progressively located within the active mine pit area

- continued use of treated water supplied from the Wetalla wastewater reclamation facility (WWRF) via an operational 45km pipeline
- continued use of a mine surface water management system
- upgrades to the existing administration and heavy vehicle maintenance area
- relocation and potential upgrade of the current power supply, including relocation of the mine's 33 kilovolt (kV) power supply and the district's 11kV power supply ring feeder power line
- relocation and potential upgrade of the existing local telecommunication network.

A full project description is contained in the project's EIS and AEIS.

2.2.2 Development stages

Subject to the granting of required approvals, the proponent estimates that approximately 2.5 years from 2015-2017 will be required to complete design, construction and other related activities that facilitate the continuation of mining, including construction of the rail spur from Jondaryan and a balloon loop within the mining lease.

Following gradual employment of additional workers, the proponent expects mining operations to commence in 2017. The proponent proposes to gradually mine the three pits generally from north to south until 2029 as shown in Figure 2.2.

A Mine Closure Plan will be developed by the proponent in advance of closure and decommissioning of the project. This plan will be developed in consultation with appropriate stakeholders and regulatory agencies, to address the key objectives in the *Strategic Framework for Mine Closure* (Australian and New Zealand Minerals Energy Council & Minerals Council of Australia 2000). Refer to Section 5.1 of this report (Land impacts) for further information on land rehabilitation.

2.2.3 Relationships with other developments

The proponent built a 45km water pipeline from Toowoomba Regional Council's WWRF. The pipeline supplies Class A+ water for the existing mine's use, and will continue to supply the project.

The pipeline was evaluated by the Coordinator-General in late 2008 and constructed in 2009. The proponent has a 43 year contract in place with the council for supply of up to 5.5 megalitres (ML) per year.

Periodically, the proponent also sources a small amount of brine from the Oakey reverse osmosis water treatment plant, located approximately 10km south of the project site.

The majority of the mine's product will be transported on the West Moreton rail system that travels to the Port of Brisbane. The proponent has a rail distribution agreement with Aurizon Limited. Queensland Bulk Handling Pty Ltd, a subsidiary of the proponent's parent organisation, operates a 10Mtpa capacity coal loading, common-user facility at the port.

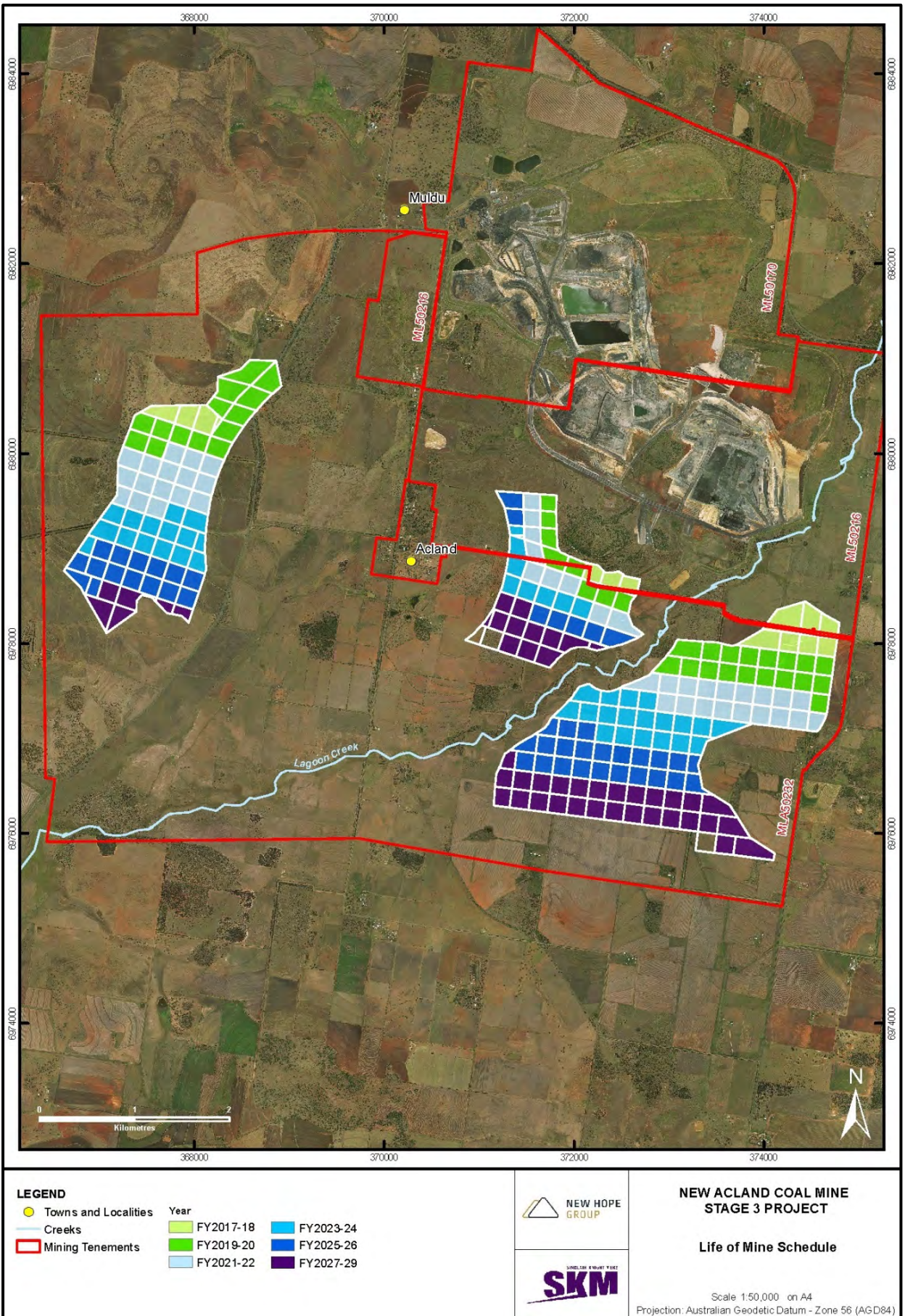


Figure 2.2 Expected project life of mine schedule

2.3 Project revision

The proponent submitted an EIS in November 2009 for the original project as declared in 2007, which was for an expansion of the NAC mine to up to 10Mtpa.

The scope of the project was altered in November 2012, significantly reducing its footprint.

The total mining lease area for MLA50232 was originally 5,069ha, and has been reduced by 1,401ha, including the abandonment of the mining lease area over the town of Acland, making the MLA 3,668ha.

Within the total mining lease area for MLA50232, the disturbance footprint has reduced from 3,658ha for the larger project, down to 1,466ha for the current proposal.

The reduction in the project throughput from 10Mtpa to 7.5Mtpa has also reduced the planned mine life from 2042 to 2029.

Other changes to the project include the removal of mining over the township of Acland, no diversion of Lagoon Creek, which dissects the project site, and confirmation that the existing Jondaryan rail coal load-out facility will be moved onto the mine site.

Due to the revised project scope, new Terms of Reference (TOR) for an EIS were issued for the project in March 2013. This report evaluates the revised project scope and corresponding EIS documentation from 2014, described in Section 3 of this report.

2.4 Project changes and updates

A description of the amendments to the project description after the release of the draft EIS is described in the AEIS. The project's revised components include:

- a proposal to construct a new road off the Pechey-Maclagan Road as a main access into the project, rather than via Cherry's Road north of the project site
- the new TLF will be located on the western side of the balloon loop, rather than the eastern side, which is approximately 350m west of the original location
- a slight adjustment to the alignment at the intersection of the Jondaryan–Muldu Road and Childs Road
- the alignment of the Jondaryan–Muldu Road will be moved to the east by approximately 200m where it intersects Cooke-McGovern Road
- the alignment of the Jondaryan–Muldu Road near Muldu will join the Muldu–Plainview Road north of the project site.

On 27 November 2014 the Department of Natural Resources and Mines (DNRM) accepted an application for MLA (infrastructure) 700001 for the project's rail spur.

3. Environmental impact statement assessment process

This section discusses the steps in the project's EIS assessment process. In undertaking this evaluation, I have considered the following:

- initial advice statement (IAS)
- EIS and technical reports
- comments and issues raised in submissions on the EIS from non-government organisations and members of the public
- AEIS
- comments and issues raised in submissions on the AEIS from non-government organisations and members of the public
- advice received from federal, state and local government agencies
- the proponent's responses to information requests.

The steps taken in the project's EIS process are documented on the project's webpage at www.dsdip.qld.gov.au/newauckland

3.1 Coordinated project declaration

On 18 May 2007, the Coordinator-General declared the project to be a 'coordinated project' under section 26(1)(a) of the SDPWO Act. This declaration initiated the statutory environmental impact evaluation procedure described in Part 4 of the Act, requiring the proponent to prepare an EIS for the project.

On 28 March 2012, the incoming government declared that it would not support the project as originally proposed due to its effects on good quality agricultural land and its proximity to local communities.

The proponent subsequently proposed a revised, smaller project in November 2012. I then determined that the EIS process can recommence at the draft terms of reference stage.

3.2 Commonwealth assessment

On 24 May 2007, the minister's delegate determined that the project is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) (EPBC ref. 2007/2423). The relevant controlling provision under the EPBC Act was 'listed threatened species and communities', under sections 18 and 18A.

The delegate also determined that the project should be assessed by way of an EIS under Part 8 of the EPBC Act, through the accredited bilateral agreement with the State. The EIS prepared by the proponent was therefore required to address potential impacts on MNES under the EPBC Act.

On 9 November 2012, the Australian Government Department of the Environment (DE) confirmed a variation to the project proposal had been accepted. The variation took into account the project's revised scope; however, the controlling provisions remained the same.

On 17 October 2013, the Commonwealth Minister for the Environment confirmed the newly created controlled action: water resources—coal seam gas and large coal mining (sections 24D and 24E of the EPBC Act) also applied to the project.

After a copy of this evaluation report is provided to the Australian Government, a decision on the controlled action under section 133 of the EPBC Act will be made by the Commonwealth Minister for the Environment. The Minister will use the information in this report to decide whether the project should proceed, and if so, if any additional conditions, beyond those I have recommended in this report, will be applied to manage the impacts on MNES.

3.3 Terms of reference

TOR for the project were originally finalised in October 2007. These were superseded when I released the final TOR for the revised project on 22 March 2013.

3.4 Review of the EIS

An EIS for the original full scale project was produced in 2009 and was released for public consultation from 14 November 2009 to 3 February 2010. This was superseded by the EIS produced by the proponent for the revised scaled-down project, which was released for public and agency comment from 18 January 2014 to 3 March 2014.

Key issues raised in public submissions on the revised project included:

- groundwater and surface water
- air and noise
- impacts on good quality agricultural land
- JRLF
- social impacts.

Key issues raised in submissions that supported the project were:

- job security for existing employees and mine contractors
- job and training opportunities for local workers
- economic benefits.

3.5 Additional information to the EIS

On 17 April 2014, I requested that the proponent submit additional information to the EIS (AEIS) to address key issues including:

- air and noise

-
- road closures
 - the *Regional Planning Interests Act 2014*
 - groundwater
 - flooding
 - JRLF closure
 - public consultation
 - complaints management and resolution
 - Acland township planning
 - economic benefits and impacts
 - fauna and flora
 - comments raised in individual submissions
 - advisory agency comments.

On 29 August 2014, I invited public comment on both the EIS and the AEIS. Submissions were sought until 29 September 2014. Submissions on the EIS and AEIS have been considered in my evaluation.

I have also considered the proponent's responses to information requests following release of the AEIS. These, along with the TOR, EIS and AEIS, are available online at www.dsdiq.qld.gov.au/newaclang

4. Project approvals

Following the release of this evaluation report, the proponent will need to obtain a range of statutory approvals from Australian, state and local government agencies before the project can proceed.

Approvals sought by the proponent for the project, for which this Coordinator-General's evaluation report includes recommended or stated conditions, are listed in Table 4.1.

Table 4.1 Approvals sought from this Coordinator-General's report

Project component/activity	Relevant approval	Legislation	Authority	Status
Whole of project	Controlled action	EPBC Act	Department of the Environment (DE)	Commonwealth Minister's decision due within 30 days of receiving Coordinator-General's report
Mining and associated activities, including the rail spur line, on the mining lease	EA for mining lease – amendment to existing EA EPML00335713	<i>Environmental Protection Act 1994</i> (EP Act)	Department of Environment and Heritage Protection (DEHP)	Draft EA conditions provided in Appendix 2 of this report
The development of rail spur and balloon loop (where on tenure) (refer to EIS)	mining lease (infrastructure)	<i>Mineral Resources Act 1989</i> (MR Act)	Department of Natural Resources and Mines (DNRM)	Draft EA conditions provided in Appendix 2 of this report
Rail spur line and balloon loop (refer to EIS)	Approval for works that interfere with a railway (rail connection to Western Rail Line)	<i>Transport Infrastructure Act 1994</i> (TI Act)	Queensland Rail	Information to support future applications is included in the EIS (chapter 13 and Appendix G) and the AEIS (chapter 5)
Rail spur line and balloon loop (refer to EIS)	Approval for level crossings over local government roads	TI Act	Queensland Rail and Toowoomba Regional Council (TRC)	Information to support future applications is included in the EIS (and the AEIS)
Road closures required due to mine activities and rail construction (refer the EIS and AEIS)	Approvals for road closures	<i>Land Act 1994</i> <i>Transport Operations (Road Use Management) Act 1995</i>	DNRM	Information to support future applications is included in the EIS and the AEIS
Road closures required due to mine activities and rail construction (refer to the EIS and AEIS)	Approvals under Local Laws: Interference with Roads	TRC's Local Law No 1	TRC	Information to support future applications is included in the EIS and the AEIS

Additional subsequent approvals required for the project, which are subject to separate application and assessment processes, are detailed in the AEIS. The proponent acknowledges that further information will be required to support these applications.

4.1 Australian Government approvals

The EIS process has been undertaken in accordance with the requirements of the bilateral assessment agreement between the Queensland and Australian governments, as discussed in Section 3.2 of this report.

The Minister will use the information in Section 8 of this report to make a decision whether or not to approve the controlled action under the EPBC Act, and if so, apply conditions to the approval necessary to manage the impact on MNES.

4.2 State government approvals

4.2.1 Mining lease

The project, including the progressive development of two new resource areas across three pits, is largely within MLA50232. The MLA was lodged in 2007. Areas of the existing mine's mining leases will also be used for the mine's expansion.

Before mining can commence, the mining lease for MLA50232 must be granted under the MR Act.

As described in Section 2 of this report, the proponent has partially abandoned sections of MLA50232, a reduction that took effect from 30 June 2014. Mining rights are not sought in the abandoned areas as part of this project.

4.2.2 Environmental authority

The proponent has an authority to operate the existing NAC mine at a maximum production of 5.2Mtpa (product coal) on mining lease 50170 and mining lease 50216 (EA EPML00335713).

The proponent has applied to amend its existing EA (EPML00335713) to include MLA50232, since a single EA is required for all resource activities that are carried out as a single integrated operation. A mining lease will not be granted until the EA amendment application is granted. The mining activity for the project will be subject to the conditions of the amended EA for mining leases 50170, 50216, 50232 and MLA (infrastructure) 700001.

The proponent prepared an EM Plan for the project (AEIS) as required by former section 150(c) (application documents for an EA mining activities) and former section 201 of the EP Act (as in force on 30 March 2013).

Under transitional provisions of the amended EP Act, an EM Plan for the mine site is required before DEHP can issue the draft EA for public notification. The EM Plan for the project will form part of the EA application (mining activities).

The EM Plan specifies environmental management strategies, actions and procedures to be implemented to mitigate adverse impacts and enhance any beneficial environmental impacts. It also specifies monitoring, reporting and auditing requirements as well as the nominated entity responsible for implementing proposed actions.

As per section 47C of the SDPWO Act, I have stated conditions at Appendix 2 of this report for the draft EA (mining activities) for activities on the MLA and MLA (infrastructure) for the project.

4.2.3 Infrastructure mining lease: rail spur

The purpose of a mining lease (infrastructure) is support mining operations to locate infrastructure on an adjacent or nearby mining lease, where no mining is actually proposed for the area. On 27 November 2014, DNRM, under the MR Act, accepted the lodgement of an application for a mining lease (infrastructure) 700001 for development of the rail spur. A decision on the MLA (infrastructure) 700001 is expected to be decided following the decision on the MLA50232.

The draft EA included at Appendix 2 includes conditions for the MLA (infrastructure).

4.2.4 Mining lease and mining lease (infrastructure)

The project is located in a Strategic Cropping Area and Priority Agricultural Area, both defined as regional interests under the *Regional Planning Interests Act 2012* (RPI Act). A development application for a Regional Interests Development Approval (RIDA) may be required when a resource activity is proposed to be located in an area of regional interest.

4.2.5 Off-lease infrastructure

The project will require realignment of electricity infrastructure, works in the vicinity of powerlines and installation of telecommunications, which may require approvals under other state legislation; for example, a notice to an electricity entity of works near electricity works under the *Electricity Act 1994*. After detailed design has been completed for these works, the proponent will need to apply to the relevant administering authorities.

The decommissioning of the existing mine's JRLF is subject to consideration under state legislation including obtaining a disposal permit for contaminated soil removal and a site rehabilitation plan and site validation. These activities are subject to the requirements of the existing EA for the JRLF, which is regulated by DEHP in accordance with the EP Act.

4.3 Local government approvals

The mine and rail components of the project are located within the local government area of TRC. The development of a mining activity for which an EA applies is exempt from assessment against a local government planning scheme under the *Sustainable*

Planning Act 2009 (SPA). Therefore, there are no applicable local government approvals for the mining lease or mining lease (infrastructure).

For works not on the mining lease or mining lease (infrastructure), the realignment and any interfering with local roads will be assessed by TRC under its planning scheme and other approvals will be required under local laws.

5. Evaluation of environmental impacts

This section discusses the major environmental effects identified in the EIS. I have included a detailed evaluation and stated or imposed conditions or made recommendations to manage adverse impacts.

As the township of Acland has now been excluded from the project's mining lease area, the proponent's proposed acquisition of Tom Doherty Park is not assessed. The site's cultural heritage has been considered in Section 5.9.

For the remaining matters, I have included a detailed evaluation and stated or imposed conditions or made recommendations to manage adverse impacts.

5.1 Land impacts

5.1.1 Area context

The project is located in the Central Darling Downs region, where agriculture is the predominant land use. The main summer crops in the project area are cotton and sorghum, mung beans, millet, sunflowers, maize and soybeans. Winter crops predominately are wheat, barley and chickpeas.

Grazing is also a key land use in the area, with summer and winter forage crops grown for grazing, or harvesting as hay or silage. Intensive animal production also occurs in the area.

Mining has been present on the Darling Downs for over 100 years. The Walloon Coal Measures, the coal-bearing unit the project will target, has been mined as far north as Wandoan, and it extends south to near Goondiwindi.

At Acland, mining began in 1913, with underground shafts sunk close to the township that grew to support both coal and agricultural production. The proponent began its current mining operation at Acland in 2002.

5.1.2 Land tenure, use and suitability

The soils within the project site are generally suitable for cropping, characterised as basalt clays, cracking earths and alluvium. The project site has a history of grazing and dryland cropping. Two feedlots and a piggery also operated on the site.

The proponent's affiliated company, Acland Pastoral Company (APC), owns all land parcels within the existing operation and the project's mining lease area. Easements are yet to be secured for the project's rail spur.

At Acland, APC owns 7,840ha of land. Of this, 5,376ha is outside the project's mining lease area and is being used by APC for grazing and livestock production. Within the mining lease area, a substantial portion of the land will still be available for grazing operations during the mine's life. Native title is extinguished across all the project's mining lease areas.

Strategic cropping land

The EIS estimated the total area of strategic cropping land (SCL) that will be impacted by project works is 1,361ha—a 63 per cent reduction from the 3,658ha of SCL proposed to be impacted for the original stage 3 project.

The project is located within a SCA and PAA under the RPI Act. The proponent will need to apply for RIDA under the RPI Act, which for SCL, includes a soil verification process to confirm how much of the land is SCL.

5.1.3 Project land requirements

The total mining lease area for MLA50232 has been reduced from 5,069ha for the original stage 3 project to 3,668ha—a 28 per cent reduction—with the proponent also abandoning the mining lease area over the town of Acland.

Around 99ha will be required for the part-diversion of Jondaryan-Muldu Road and for the rail spur.

5.1.4 Land impacts, mitigation and management measures

Disturbance footprint

Impact

The disturbance footprint for the stage 3 project, which includes pits, slope batters, out-of-pit dumps and infrastructure, is 1,815ha. Within the MLA, the disturbance footprint has been reduced to 1,466ha from 3,658ha—a 60 per cent reduction from the disturbance footprint proposed for the original stage 3 project. This disturbance would occur across two existing mining leases: the project's MLA50232 and MLA (Infrastructure) 700001.

Post-mining, the proponent has committed to return the majority of the land to self-sustaining pasture for grazing.

Mitigation and management measures

APC currently runs cattle on rehabilitated land from its existing operation, with grazing trials underway to inform improvements to the management of rehabilitated land.

APC has sought input on the trials from a local university and a contracted agricultural specialist, as well as using the local farming expertise of APC staff. The trials will be

ongoing and will be applied to the project's rehabilitation areas. Data gathered over time about the success of rehabilitated land, and the quality of beef from cattle run on the revegetated pasture, will inform the proponent's strategy to maximise rehabilitation outcomes.

The proponent will progressively rehabilitate mined land as new pit areas are opened up. Other disturbance areas, such as haul roads, the rail spur, mining infrastructure area (MIA) and CHPP will also be rehabilitated post-mining.

The proponent has prepared a Topsoil Management Plan that details how topsoil will be stripped, stockpiled and maintained, particularly to protect it from erosion. The proponent has committed to undertake further soil surveys to refine the Topsoil Management Plan prior to commencing topsoil stripping.

The Topsoil Management Plan also provides the proposed method of re-applying topsoil post-rehabilitation, how re-seeding would be applied to establish vegetation as soon as possible to avoid soil loss from erosion, and the management measures that will be implemented to improve the early survival success of re-established vegetation.

The project's land rehabilitation program is also supported by a Final Land Use Rehabilitation Plan (FLURP), the project's long-term land rehabilitation, use and management strategy. The FLURP includes erosion control procedures, revegetation goals, success targets and criteria, long-term monitoring, reporting on revegetation success and remediation strategies if required.

The FLURP also includes management of protected areas within the project area, such as the Lagoon Creek conservation management zone, offsets areas, and threatened species translocation sites.

To ensure the rehabilitation of agricultural land is enhanced, I have conditioned detailed requirements for pre-mining soil surveys, in order to confirm the values of land before it is disturbed. The surveys are intended to confirm the different soil types and qualities within the disturbance footprint.

My conditions also require undisturbed reference sites of the same soil type to be identified on the proponent's land. These sites will act as a reference point and the benchmark for rehabilitated land of the same soil type.

I have also set conditions requiring that, post-mining, rehabilitation be undertaken to re-establish discrete land units, with each to be assigned a specific post-disturbance land use suitability. In this way, mixing of soil types will be avoided.

I require that rehabilitation of disturbed land is to result in the best post-disturbance land use possible. The success of the rehabilitated land is to meet set success criteria on matters such as soil attributes, plant density, yield of harvestable material, and botanical composition.

The project will disturb land that currently meets or exceeds the criteria for either Class 3 grazing land or Class 4 cropping land. At least 50 per cent of the total area of this post-disturbance land must meet or exceed those classifications. The post-disturbance agricultural land value of each land unit is to be sustained on an ongoing basis and obtainable without the use of irrigation.

I have further conditioned that an annual report on the findings and outcomes of the rehabilitation of disturbed land is to be made publicly available.

Mine pits and voids

Impact

The combined area for the Willeroo, Manning Vale East and Manning Vale West pits is estimated at 1,201ha. The final void areas would total around 457ha, with depths of between 40–70m.

Mitigation and management measures

The proponent has committed to infilling around two-thirds of mined areas, with final voids estimated to total around 457ha. In order for grazing to occur at the outer edges of the voids, NAC intends to slope these void edges rather than leave a sheer, fenced drop.

Within the pits, the voids will be benched and profiled, with slope angles no greater than 17 degrees, allowing grazing at some areas within the final voids; however this use will be constrained by the likelihood that each of the three voids will feature permanent lakes due to groundwater inflows.

To account for land permanently affected by mine voids, I have conditioned that equivalent land is to be secured, and the land's agricultural values improved and managed until the mining lease is surrendered.

The equivalent land is required to be 'like for like'; so for the amount of affected land defined as priority area land use (PALU) in the state government's Queensland land use mapping program, and land defined as non-PALU, the same amount of PALU/non-PALU is to be secured, with its tenure protected by covenant.

PALU is defined as a highly productive agriculture land use, including cropping, horticulture, irrigated agriculture and plantations. Non-PALU is an agricultural land use that includes grazing, production forestry, intensive animal husbandry and dairy.

I have set conditions requiring the proponent to improve the productivity of these equivalent land areas from the time they are secured. Improvements could be targeted at controlling soil erosion, pest and weeds, better land management practices and land use.

I have also set conditions in the draft EA in Appendix 2 on land rehabilitation that require final landforms to be safe, non-polluting and stable.

Coordinator-General's conclusion

I am satisfied that the proponent's commitments, management plans and the conditions I have set will minimise the impacts on agricultural land disturbed by mining.

Prior to construction, the project will need to apply for a RIDA under the RPI Act. The proponent's application will need to include detail about land impacts in accordance with the Act's application requirements. The soil verification measures I have

conditioned in this report will complement the information required to be provided as part of a RIDA.

5.2 Noise and vibration

For the management of noise and vibration, the outcome I require is that with the application of sufficient mitigation measures and by meeting all relevant Environmental Protection (Noise) Policy 2008 (EPP (Noise)) standards, the project is able to operate without creating adverse noise impacts for sensitive receptors (SRs), such as homesteads, located close to the mine.

The proponent is required to ensure that activities that have the potential to cause vibration impacts are undertaken in accordance with the *Guideline—Noise and Vibration from Blasting* (Department of Environment and Resource Management [DERM] 2006). Noise objectives are measured at the locations of SRs.

Sensitive receptors

Noise from the project's mine and rail spur could affect nearby SRs, including homesteads and businesses. Forty-four SRs (43 homesteads and one business), are located within 10km of the mine. Around 40 homesteads are located within 5km of the project site. Figure 5.1 shows the locations of SRs near the mine.

Four SRs (numbers 31 (a business), 32, 33 and 34 (homesteads)) will be located within 700m of the MLA (infrastructure) 700001, with the closest being a business located 400m from the line.

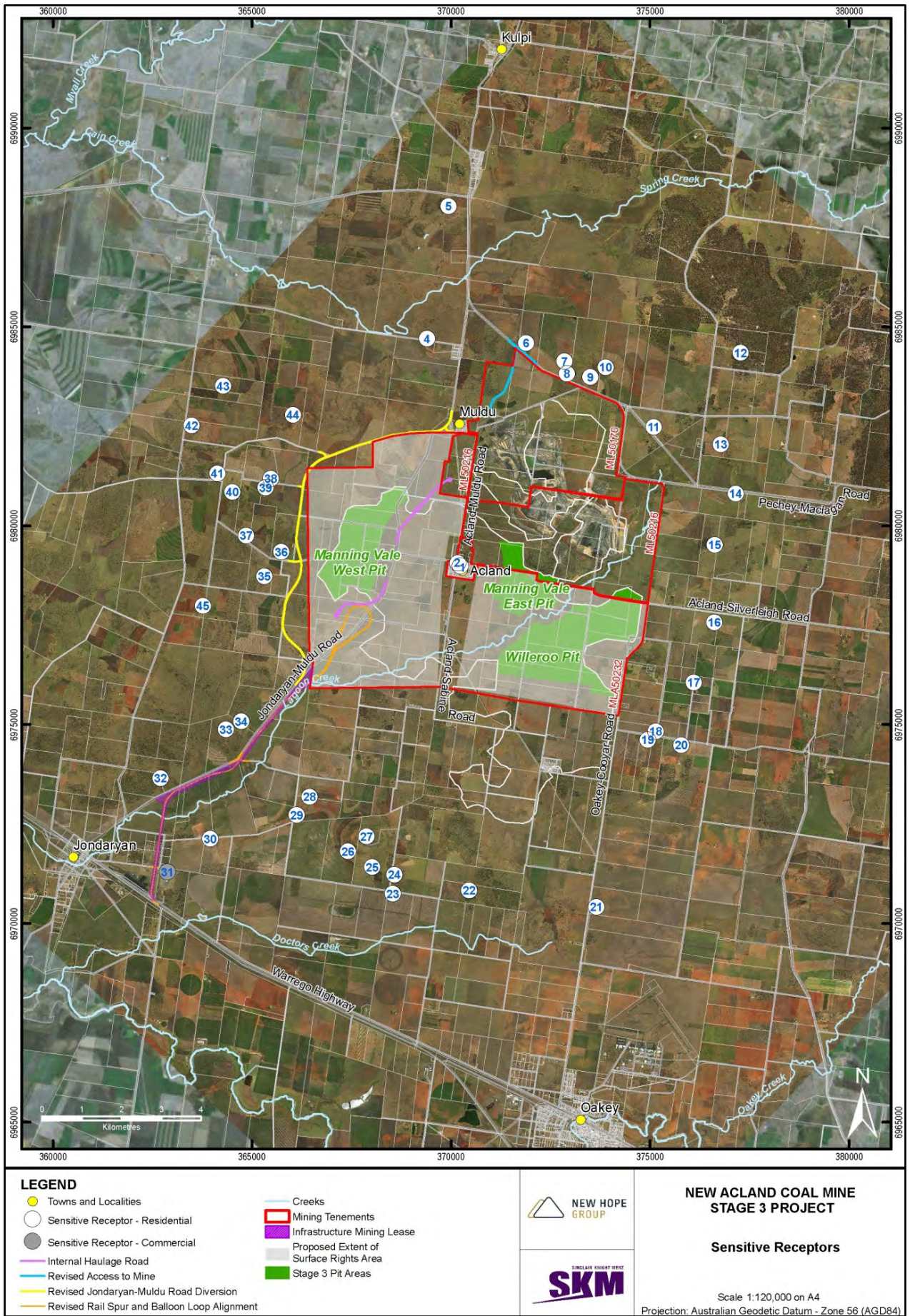


Figure 5.1 Locations of nearby sensitive receptors

5.2.1 Mine and rail spur noise

Impacts

Construction activities associated with the expansion of the CHPP, MIA, MHF and the construction of new dams, the TLF and rail spur, will occur during the day and are not expected to result in excessive noise.

During operations, noise will be generated from the use of drilling rigs, excavators, loaders, and water and dump trucks; and from blasting, which will be the noisiest activity. Activities at the CHPP and use of conveyor systems may also be audible for people nearby.

Up to 80 rail movements per week will occur when the mine is at peak production. Construction of the rail line and TLF will occur during the day and is not expected to result in noise exceedances.

Predictive modelling outputs

Noise modelling was undertaken, considering the mine's program of works for the years 2019, 2023 and 2029, assuming the use of equipment that utilises noise attenuation measures.

The modelling looked at worst-case and neutral meteorological conditions and the impact on sound travelling. Worst-case is where meteorological conditions would make sound more likely to travel, termed as Stability Class F. Neutral conditions are termed as Stability Class D. Modelling indicated there would likely be a 4–6 dB(A) difference between the two noise levels.

Noise levels were modelled for day, evening and night-time scenarios to account for the proposed 24-hour operation of the mine. Table 5.1 provides an assessment of predicted noise levels compared with the EPP (Noise) objectives of $42L_{Aeq,adj, 1hr}$ for daytime and evening; and $37L_{Aeq,adj, 1hr}$ for night-time. The table also provides an overview of class F and class D modelling results across early, middle and late years of the mine's operation (2019, 2023, and 2029), for daytime and night-time noise. The results confirm that for stability class D and F conditions, the mine can meet the EPP (Noise) objectives at nearby SRs.

Table 5.1 Predicted noise levels against EPP (Noise) criteria at selected sensitive receptors

Scenario	Daytime and evening, stability Class F			Night-time operations, stability Class D			Night-time operations, stability Class F		
	Receiver	2019	2023	2029	2019	2023	2029	2019	2023
1	38	41	42	32	32	31	37	37	37
2	39	40	40	32	32	31	37	37	37
4	34	34	34	28	28	28	34	33	33
6	35	35	35	30	30	30	35	35	35
7	34	35	34	28	29	28	34	34	33
8	35	35	35	29	30	29	35	35	34
9	33	33	32	26	27	26	32	32	32
16	34	31	27	28	24	20	33	29	26
35	31	33	33	26	27	27	31	33	33
36	34	35	36	28	30	31	34	35	36
Noise criteria	LA_{eq,adj,1 hr} 42dB(A)			LA_{eq,adj,1 hr} 37dB(A)			LA_{eq,adj,1 hr} 37dB(A)		

Additional modelling was conducted for the rail spur. Modelling for the rail spur indicated noise levels would be at least 29dB(A) (for L_{Amax}) and 18dB(A) (for 37L_{Aeq} (24hr)) lower than the Queensland Rail Code of Practice noise criteria.

Mitigation and management measures

The proponent has prepared a Noise and Vibration Management Plan (NVMP) that includes commitments and measures to mitigate noise impacts and adhere to EPP (Noise) standards, including:

- investing in noise attenuating equipment (replacing noisier machinery with attenuated equipment, investing \$12 million in attenuating the existing mine’s fleet, investing \$116 million to progressively replace key mining equipment over the next 3–5 years, and ongoing investigation of noise-reduction options).
- conducting real-time noise monitoring at SRs
- implementing an adaptive noise management program—using live trend observations and live audio monitoring that will trigger warning and exceedance alerts, which will result in on-site operations relocating, modifying or ceasing mining activities
- changing operational procedures (scheduling noisier operations during the day, using topsoil and overburden dumps as noise barriers between active mine operations and nearby SRs, limiting the speed of heavy vehicle traffic on haul roads)
- improving the proponent’s complaints management processes
- reporting (monthly) on performance against noise objectives.

The mine's current operation has implemented a Trigger Action Response Plan (TARP) trial to test the ability of an adaptive management program to reduce noise. The TARP has used real-time noise monitoring, which resulted in instructions being relayed to site to cease or modify noisy operations. The trial has been used by the proponent to understand if compliance with EPP (Noise) levels could be achieved. While the full suite of noise-attenuated equipment is not yet operational, the proponent has advised that improvements to noise levels have been achieved due to the TARP trial.

I have set noise limits in the draft EA for both mine and rail noise spur noise. The proponent must achieve these limits at the locations of all SRs.

Coordinator-General's conclusions

I am satisfied that the proponent's investment in noise attenuated equipment, coupled with the adaptive noise management program, will effectively manage noise caused by mining operations. The proponent must meet conditions I have stated in the project's draft EA for all mine-related noise.

The conditions stated in the project's draft EA (Appendix 2) require mine-related noise, as measured at a SR, is not to exceed $42L_{Aeq,adj,15\ min}$ from 7am to 10pm, and $37L_{Aeq,adj(15min)}$ from 10pm to 7am, for all days.

I have also stated conditions for L_{Amax} noise levels for the project, to minimise the occurrence of night-time sleep disturbance. This measure relates to short, sharp sounds.

I have set conditions that state if monitoring indicates the potential for exceedance of set noise limits, the proponent must immediately implement noise abatement measures to avoid exceeding limits. The proponent is also conditioned to publicly report on noise on a monthly basis.

To ensure rail-related noise limits are met, I have stated conditions in the draft EA (Appendix 2), with limits of $56L_{Amax}$ and $37L_{Aeq(24hr)}$ stated for noise between 10pm and 7am, on all days.

5.2.2 Vibration

Impacts

During operation, depending on excavation schedules, the proponent may undertake up to eight single blast events per week, with blasting required to loosen overburden in mine pits. No SRs would be located within 1km of blasting.

Management and mitigation

The EIS predicted that blasting vibration and overpressure standards would be met for all SRs, once mitigation measures are applied. Vibration levels are expected to be minimal beyond 100m from the blast site.

Measures proposed to manage noise and vibration impacts from blasting include:

- conducting blasting in accordance with the DEHP Ecoaccess guideline *Noise and Vibration from Blasting*
- restricting blasting to specific time periods—7am to 6pm Monday to Friday, and 9am to 1pm Saturday
- notifying nearby residents who would like to receive advance warning about blast events
- for blasting that occurs within 1.5km of a SR, undertaking multiple-pass blasting, which would use smaller amounts of explosives.

Coordinator-General's conclusion

I am satisfied that the measures proposed to manage noise and vibration impacts, along with the conditions I have stated in Appendix 2, will be sufficient to manage the impacts of blasting.

I have set conditions that control airblast overpressure and ground vibration peak particle velocity in line with the limits set in the *Guideline—Noise and vibration from blasting* (DERM 2006). Other conditions that control potential disturbance from blasting are also included at Appendix 2; including that a Blast Monitoring Program is to be developed that shows compliance with set limits.

Conditions also set blast monitoring criteria and reporting requirements. I have conditioned the above time limitations on when blasting may occur, namely that blasting is not to occur at night-time, or on Saturday afternoons, Sundays or public holidays.

5.3 Air emissions

5.3.1 Mine and rail spur dust

In both the EIS and AEIS, potential impacts were assessed against the Environmental Protection (Air) Policy 2008 (EPP(Air)) objectives for dust deposition rates and for ground level concentrations of total suspended particles (TSP), particles with a diameter of less than 10µm (PM₁₀) and particles with a diameter of less than 2.5µm (PM_{2.5}). The proponent must achieve compliance with the EPP (Air) objectives throughout all project stages. Air objectives are measured at the locations of sensitive receptors.

Sensitive receptors

The proponent has modelled the extent of dust and particulate emissions from the mining activity in the surrounding area.

Forty-four potential SRs were identified within 10km of the project. The SRs identified include homesteads of grazing properties, residential premises within the township of Acland and a single commercial premise. Of all SRs, approximately 40 are located within 5km of the project site. During the preparation of the AEIS, a sensitive receptor

to the north of the project site was purchased by the proponent and is no longer considered a SR.

Four SRs are located within approximately 700m of the new rail spur. The closest, SRs 31 and 32, are located around 400–500m from the proposed location for the rail spur. The locations of all potential SRs are identified in Figure 5.1 in section 5.2 of this report.

Impacts

Over the life of the mine, air quality will periodically change as a result of activities such as blasting, haulage, excavation works, and coal processing and stockpiling. During dry seasons (June–September), the concentration of airborne particulates from project and non-project activities in the area may be exacerbated due to low rainfall and, in the colder months, poorer atmospheric dispersion.

Predictive modelling outputs – Mine

In evaluating potential air quality impacts at the SR locations, four CALPUFF modelling scenarios were considered in the EIS and the AEIS for the years 2019, 2023 and 2029 (two were conducted for 2029) – representative of air quality impacts across the life of the mine. The scenarios were used to:

- predict and quantify the project's air quality impacts, should only typical industry dust control measures be applied
- establish the effectiveness of proposed additional dust management controls, including a pre-emptive and adaptive air quality management program.

Due to prevailing easterly winds, SRs located west of mining operations were evaluated to have the highest potential to experience air quality impacts. SRs 1, 2, 35 and 36, approximately 1km west of mining pits, were assessed to have the highest risk of air quality impacts.

Table 5.2 presents the monthly dust deposition suspended particle rates on the eight SRs for which air quality objectives may be exceeded over the life of the mine.

Predicted exceedances of relevant EPP (Air) objectives are highlighted in blue. With adaptive air quality management applied, modelling indicated that mining operations could achieve the EPP (Air) objective at the locations of all SRs.

Table 5.2 Predicted monthly dust deposition rates and PM₁₀ concentrations for all mining scenarios 2019–29

Sensitive receptor (see figure 5.1 for location)	Air objective: Monthly average dust deposition <120(mg/m ² /day)			Air objective: 50µg/m ³ for the PM ₁₀ 5th highest 24-hour average per year (µg/m ³ /24-hour average)			2029 scenario with adaptive management	Residual impact
	2019	2023	2029	2019	2023	2029		
1	137	15.161	114	50	51	53	39	14
2	122	134	100	43	50	48	35	13
35	87	119	138	54	82	88	38	50
36	96	148	130	61	94	74	34	40
37	91	111	97	53	67	53	29	24
38	101	80	74	56	43	39	23	16
39	101	83	75	57	44	40	23	17
45	–	109	–	–	51	–	#	–

Predicted exceedances in EPP (Air) objectives are highlighted.

SR 45 was not modelled in the adaptive management scenario for 2029. Results could be considered comparable to SR 35.

Rail spur dust

The AEIS presented minor amendments to the projects mine infrastructure. SRs 1 and 2 are now located approximately 2km away from the northern reaches of the balloon loop associated with the TLF. Although rail related infrastructure has moved approximately 250m closer to some sensitive receptors, a revised air impact assessment was deemed not necessary. The proponent does not anticipate negative air impacts on any of the identified SRs located in close proximity to the rail spur and TLF.

Mitigation and management measures

Typical dust mitigations

The proponent has committed to implementing best practice air quality management measures, including:

- minimising drop-height during materials extraction and handling
- using a sealed haul road from the CHPP to the TLF
- limiting on-site traffic speeds to 60km/hour
- watering of exposed areas, with a focus on stockpiles and high traffic areas
- progressive rehabilitation behind active pit areas, with vegetation cover established as soon as possible
- installation of automatic water sprinklers and dust curtains within the mining infrastructure areas, including the CHPP, MHF, ROM bins and connecting conveyor belts

- veneering and profiling of loaded wagons and sweeping of coal from sills at the TLF.

Adaptive air quality management program

To comply with all relevant EPP (Air) objectives, the proponent has committed to undertake a predictive and adaptive air quality monitoring and management program. The proponent's air quality mitigation and management measures are provided in the Air Quality Management Plan (AQMP) which underpins air management as detailed in the EM Plan. Key air quality mitigation and management measures are also confirmed in the proponent's commitments.

Key evidence-based elements that will inform the adaptive AQMP are:

- daily dust forecasts emailed to site management providing likely meteorological conditions and associated dust risk
- active air quality monitoring, including:
 - three real-time PM₁₀ monitors located to the east, west and at the centre (Acland) of the project area
 - one real-time TSP monitor
 - a meteorological station taking hourly readings, located at Acland
 - four PM₁₀ monitors taking quarterly readings
 - more than 20 dust deposition gauges surrounding and central to the project area recording dust fall-out, measured monthly
- alarm notification generated by data collected from the PM₁₀ real-time monitors continually measuring compliance with relevant EPP (Air) objectives
- visual observation of dust generation from site areas.

The AQMP presents a hierarchy of controls that will be applied by site management. Controls include additional watering, suspension of activities (such as dozer operations on overburden dumps), and reduction, relocation or ceasing of some or all mining activities. The AQMP confirms that, should the real-time monitoring indicate an exceedance, DEHP will be advised. The proponent must also report to DEHP on actions taken to ensure compliance with the conditions of the draft EA.

Dust monitoring and locations

To inform the dust forecasting system, the proponent proposed to install a single real-time TSP monitor, which would be a modified Tapered Element Oscillating Microbalance (TEOM) device. Given there are no Australian Standards to specify its operation, I have conditioned the proponent to install a TSP high-volume sampler, with this instrument to be operated in accordance with the relevant Australian Standard, near the real-time modified TSP TEOM. This will be used to calibrate the results from the real-time air quality monitor.

Given the proximity of SRs 1 and 2 to mine pits east and west of the town of Acland, and to enhance the project's air quality monitoring dataset, I have conditioned the proponent to install additional TSP monitors at Acland and to the east of the mining

operations. These two TSP monitors will be in addition to the meteorological station, real-time PM₁₀ monitors and dust deposition gauges already proposed for Acland.

For the three real time PM₁₀ monitors, the proposed locations will provide an indication of upwind and downwind conditions at the mine and assist the proponent to understand the effects of mining activities on emission levels. I have conditioned that the proponent develop an Air Emissions Management Plan that includes a program for reviewing and continuously improving dust management practices.

Rail spur—dust mitigation and management

To ensure dust will be minimised during the loading of coal onto wagons at the TLF and transporting coal along the rail spur and onto the public rail network to port, the proponent has committed to:

- an enclosed overhead bin that will deliver the coal to each rail wagon as part of the train loadout system
- veneering and profiling the loaded coal to minimise dust emissions during transport
- coal being loaded by side tipper into a hopper as part of the train loadout system.

To minimise air quality impacts, I require the proponent to prepare and implement a coal dust management plan (CDMP) that accords with the existing South West System CDMP. The project's CDMP must identify specific control measures to minimise dust emissions from loaded and unloaded train wagons, and be approved by DTMR before significant construction works commence. The CDMP will specify that veneering will continue to be undertaken for the life of the project.

Coordinator-General's conclusions

I am satisfied that, based on the predictive modelling undertaken, coupled with the implementation of an adaptive AQMP for mining operations and the CDMP for coal loading and rail operations, dust emissions resulting from the project's construction and operation can be suitably managed.

To ensure dust impacts are managed, I have conditioned in the draft EA that the proponent must not exceed the relevant EPP (Air) limits at any SR during any stage of the project.

5.3.2 Blast fume

I requested additional information from the proponent about blast fume events at the existing mine. Blast fume events are occurrences where the fumes from a mining blast travel beyond a mining lease boundary.

The proponent confirmed the mine's last blast fume event was in 2011, when it was found that fume likely travelled beyond the western boundary of ML50216. Since this event, the proponent has introduced stronger blast fume management protocols, which were reviewed by DNRM. To date, no further reportable blast fume events have occurred.

Impact

Noxious fumes from blasting events have potential to cause adverse health impacts on persons who become exposed. As stated in the proponents commitments, blasting activities will only be undertaken during daylight hours and will not generally be undertaken on Sundays or public holidays.

Mitigation and management measures

The proponent has confirmed that currently, neighbours of the mine are informed in advance about the timing and nature of upcoming blasting events, and has committed to continue these arrangements for the Stage 3 project.

DNRM's *Queensland Guidance Note QGN 20 v3: Management of oxides of nitrogen in open cut blasting* (QGN 20v3) provides guidance on preventing, managing and treating exposure to noxious fumes that may arise from blasting (visible nitrogen dioxide that moves outside of the standard blast exclusion zone). To avoid fume events occurring, the proponent has prepared fume management procedures in accordance with QGN 20v3.

The *Coal Mining Safety and Health Act 1999* and the *Explosives Act 1999* regulate fume and blasting events in Queensland. The legislation requires reporting of incidents (including exposure to fume events) to relevant authorities. To ensure compliance, the Mines Inspectorate and the Explosives Inspectorate of DNRM may conduct audits and inspections of the project.

Coordinator-General's conclusions

I acknowledge the proponent has committed to implement fume management procedures as part of the AQMP to prevent and manage exposure to noxious fumes that may result from blasting events. The proponent has committed to ensure blasting events only occur during daytime hours of operation and generally not on weekends.

5.3.3 Road transport – coal dust emissions

Impact

Around 200,000 tonnes of coal will be transported by road to customers in south-east Queensland and northern New South Wales. Public submitters raised concerns about uncovered coal trucks and air pollution.

Mitigation and management measures

DTMR's *Smart practice guide load containment requirements for haulage of coal on Queensland public roads* (2014) includes the requirement that all trucks have loads covered during road transportation. In accordance with the performance standards of the Load Restraint Guide, empty trucks must also be covered to meet compliance. I note that the only exception to operators covering loose bulk loads is when a certified wetting containment system, such as veneering, is established.

I require the proponent to develop and implement a CDMP for road transportation tasks. The CDMP must address how coal dust emissions will be minimised while loading, hauling and offloading coal, and for empty vehicles travelling to site. The plan must be prepared in accordance with the Smart Practice guideline and is to state that contractors who transport product coal must also adhere to the guide.

Coordinator-General's conclusions

I am satisfied that road dust emissions can be effectively managed through the establishment and implementation of a CDMP in accordance with DTMR's *Smart practice guide load containment requirements for haulage of coal on Queensland public roads* (2014). The CDMP will describe how compliance with the guide will be achieved by the proponent and state the requirements for road transport contractors.

5.3.4 Greenhouse gas emissions

Under the *National Greenhouse and Energy Reporting Act 2007* (Cwlth) (NGER Act), the proponent must report on greenhouse gas (GHG) emissions. To determine which corporations are affected by the NGER Act, the proponent must determine if facility thresholds or corporate group thresholds are exceeded.

The NGER Act prescribes an accounting methodology and includes the following scope definitions for emissions attributable to a project:

- Scope 1 (direct emissions)—must be reported
- Scope 2 emissions (indirect emissions from the consumption of purchased electricity)—must be reported.

Scope 3 includes all indirect emissions that are not included in Scope 2, and are a consequence of the activities of the facility but occur at sources or facilities not owned or controlled by the entity. Reporting Scope 3 emissions is not mandatory and was not assessed by the proponent in the EIS.

Impacts

The main contributors to Scope 1 and Scope 2 GHG emissions from the project include:

- direct carbon dioxide emissions (CO₂-e) from combustion of diesel in mining equipment and trucks
- indirect CO₂-e due to consumption of electricity
- CO₂-e from open-cut mining.

Under the facility thresholds of the NGER Act, reporting of annual greenhouse gas emissions is required for projects with predicted annual CO₂-e of 25 kilotonnes (0.25Mt CO₂-e) or more per year.

The project is estimated to generate 2.4Mt of CO₂-e over the life of the mine. Based on a 13-year operational period, average greenhouse gas (GHG) emissions of 0.18Mt CO₂-e are expected annually, representing an increase of 0.055Mt CO₂-e compared to

the existing stage 2 operations. The EIS stated that, in total, the project will represent 0.03 per cent of Australia's annual GHG emissions.

Mitigation and management measures

Although the proponent evaluated that CO₂-e from the project will not exceed the facility thresholds under the NGER Act, the proponent has committed to report CO₂-e emissions under the National Greenhouse and Energy Reporting System.

To further minimise GHG emissions, the proponent has committed to specific management measures, including:

- reducing fuel usage
- reducing electricity use
- using alternative fuels
- analysing and reporting on emissions
- using efficient production technologies.

Further to the proponent's commitments, the EM Plan presents additional GHG management measures, including:

- capturing or flaring coal seam gas
- carbon sequestration
- contributions to research and industry bodies.

Coordinator-General's conclusions

I am satisfied that the GHG emissions assessments provided in the EIS adequately quantified the project's Scope 1 and 2 GHG.

I note that although the assessed CO₂-e from the project do not exceed the facility thresholds of the NGER Act, the proponent has committed to report on CO₂-e annually and implement various management measures. I am satisfied that the proponent is aware of the legislative requirements of the NGER Act to report CO₂-e and has committed to implementing measures to reduce GHG emissions in the design, construction and operation of the project.

5.4 Traffic and transport

At full capacity, up to 7.5Mtpa of product coal will be transported off-site, with the majority (up to 7.3Mtpa) to be transported on the West Moreton rail line to the proponent's coal-loading facility at the Port of Brisbane.

The existing mine transports coal by road to the rail load-out facility at Jondaryan. The proponent proposes to relocate the JRLF to the mine site, where product will be loaded on trains that will travel via an 8km rail spur and connect to the West Moreton rail line. This will remove around 11 trucks per day from the local road network.

Each year, around 0.15Mtpa of product coal is trucked from the mine by third-party contractors to domestic customers. This will increase to around 0.2Mtpa for the project.

The project will not utilise fly-in fly-out arrangements or on-site workers' camps. Staff will commute to site from the local area.

An aviation hazard management plan was developed by the proponent to mitigate and manage potential impacts on the Oakey Army Aviation Centre. Provided the mitigations are applied to mining operations, no direct or indirect impacts on operational airspace are expected to occur.

5.4.1 State-controlled and local roads

Local roads surrounding the mine are generally unsealed accesses to rural properties or dual lane roads that travel through local towns, including Acland, Muldu, Jondaryan and Oakey. Local roads are controlled by TRC.

Key state-controlled roads (SCRs) near the project include:

- Warrego Highway (Toowoomba–Dalby)
- New England Highway (Yarraman–Toowoomba)
- Gore Highway (Millmerran–Goondiwindi)
- Oakey-Cooyar Road
- Pechey-Maclagan Road
- Oakey-Connection Road
- Acland-Silverleigh Road (partial closure proposed for the project).

The project's potential impacts on intersections, level crossings, road pavement, congestion and safety were considered in the EIS and AEIS.

The Department of Transport and Main Roads (DTMR) *Guidelines for Assessment of Road Impacts of Development* (GARID) was used to assess impacts on SCRs and to consider impacts on local roads. In assessing the project's impacts on SCRs, GARID requires any road with a predicted increase in traffic of more than five per cent caused by a project to be evaluated to determine if the impacts are acceptable and whether mitigation is required.

Transport network capacities

Traffic generated by the revised project is predicted to be approximately 360 vehicles per day during construction, and 240 vehicles per day during operation. For construction, around 2,820 transport tasks are anticipated per day, mainly to transport earthmoving equipment and materials for an on-site concrete batching plant. Around 60 oversized vehicle trips will be required. A new access point to the MIA will be constructed off the Oakey-Cooyar Road.

The EIS and AEIS assessed impacts on existing road link capacities. Evaluation of levels of service (LoS) for surrounding roads determined that project traffic would not adversely affect existing road link capacities by greater than five per cent.

To ensure that any changes to road impacts during the detailed design and planning stage of the project are adequately considered, I have conditioned the proponent to finalise a road impact assessment (RIA) during this phase. I have also conditioned that,

dependent on the findings of the RIA, the proponent is required to finalise a Road-use Management Plan (RMP) for all project stages, and reach agreement with TRC and DTMR on the plan in advance of construction. The RMP must show how the project will ensure the efficient use of the road network, and minimise road-based trips on all state-controlled and local roads. Further, I have recommended a condition that the project must maintain the safety, condition and efficiency of rail and state-controlled and local roads during the construction and operation of the project.

Intersections

Proposed intersections and upgrades

Access to the project will be provided at the junction of the new internal MIA Northern Access Road and the state-controlled Oakey–Cooyar Road. The proposed intersection will provide access to the project site for both heavy and light vehicles.

For all intersection upgrades associated with the project, my conditions require upgrades to be undertaken in accordance with state and local road planning and design policies, principles and manuals. Approval for these works will need to be obtained under requirements of the *Transport Infrastructure Act 1994* (TI Act) no later than six months before construction begins. I also require that Traffic Management Plans (TMPs) to be developed for each location where the proponent will undertake road works and at site access points adjoining SCRs.

Existing intersections

As defined by DTMR guidelines, degree of saturation (DoS) describes the thresholds by which additional traffic will generally result in increased delays and queues at intersections. The SIDRA five-intersection analysis modelling tool was used by the proponent to assess potential impacts on DoS levels of existing intersections resulting from project traffic.

The analysis suggested that the only intersection likely to experience increased DoS levels is the junction at Jondaryan-Sabine Road/Warrego Highway which is also in close proximity to an existing rail crossing. By year 2021, delays at this intersection are predicted to occur and the intersection will begin to perform unsatisfactorily. The proponent considers improvements to this intersection will be required by DTMR as traffic modelling shows increases of traffic regardless of project contributions. This intersection continues to be the subject of discussions between DTMR, TRC, rail authorities and the proponent. The intersection upgrade will need to be finalised to DTMR and TRC's satisfaction within the RIA.

Further analysis of traffic counts for other specific intersections was provided in the AEIS as requested by DTMR. All intersections must comply with DoS thresholds at all stages of the project, including the Oakey-Cooyar Road/Acland-Sabine Road, which will become the main southerly access to Acland. For this intersection, I have recommended a condition that requires the proponent to erect new signage to indicate the route to Acland.

Level crossings

A safety assessment of level crossings near the project was undertaken by the proponent, with the locations of rail crossings shown in the EIS.

The EIS identified two existing rail crossings likely to be impacted by the project:

- Oakey Connection Road/Oakey–Cooyar Road
- Jondaryan-Sabine Road/Warrego Highway.

New rail crossings are proposed at Jondaryan–Sabine Road and Childs Road to accommodate the new rail spur. Details of these crossings will be determined during the detailed design phase of the project.

An RIA must be finalised during the detailed design and planning stage of the project and provided to TRC and DTMR for assessment. This will confirm requirements for any new rail crossings, treatments to existing crossings, road upgrades and road intersections that the project will need to deliver.

Safety will be a primary consideration in designing the rail spur, as rail crossings must be constructed and upgraded to a standard that ensures safe passage by road users. The proponent has committed to liaise with Queensland Rail and Aurizon to ensure measures are put in place to maintain level crossing safety. The proponent will require rail crossing approval from DTMR where changes to existing and new rail crossings are proposed. In these instances, I have recommended a condition stating that the proponent must prepare an Australian Level Crossing Assessment Model (ALCAM).

The ALCAM assessment must address current and existing traffic flow and train movements, expected future traffic flow, and mitigation measures to address any issues identified in the ALCAM assessment to maintain safety. The ALCAM assessment will also aim to reduce road traffic congestion at the locations of level crossings and the risks associated with road and rail conflicts.

I am satisfied Queensland Rail will consider the most appropriate treatment at the locations of level crossings to maximise the safety and protection of transport network users.

Road closures and realignments

Twelve local roads and one state-controlled road (SCR) near the project site are proposed to be closed, partially closed or realigned. These changes could significantly alter the local road network unless mitigated. Of these closures, 10 are required to facilitate expansion of the mining areas, two to realign the Jondaryan-Muldu Road around the mining lease, and one to establish the rail spur. It is proposed that the realignment of Jondaryan-Muldu Road will be constructed and maintained by the proponent.

Roads to the east and west of the town of Acland will be the most impacted, however the EIS confirms that access to Acland will be maintained during all stages of the project. Access from Acland to the township of Oakey will be south-east via Oakey-Cooyar Road and Acland-Sabine roads. NAC proposes to upgrade the latter road to support it becoming the main access to the south of Acland. The diversion of

Jondaryan-Muldu Road to the west of the project site will mean that travelling to Jondaryan south-west from Acland via Muldu will take longer.

Submissions on the EIS and AEIS raised concerns about road closures, diversions, and the additional travel times and distances that could result. Landholders closest to the project site may incur additional travel distances of up to 31km due to road closures and realignments.

The AEIS presented response times of key emergency services accessing the township of Acland from the surrounding localities of Jondaryan, Oakey, Goombungee, Toowoomba and Highfields. Potential increased emergency service response times due to road closures and realignments pose risks for some residents near the project site. For emergency vehicles travelling to Acland, increased travel distances from Jondaryan and Goombungee could occur by up to 19km and 10km respectively. Emergency access from Oakey is not likely to increase substantially, and may be reduced from Toowoomba with the use of Oakey-Cooyar Road.

One school bus route (route S24) could be impacted by proposed road closures. The proponent proposes to gradually relocate the route to align with the new access road to Acland.

In seeking to close or divert roads, the proponent is obligated to obtain approval prior to construction from DNRM as administrator of the *Land Act 1994*. Where local roads are involved, TRC will be consulted by DNRM as part of the application process. The proponent has committed to consult with DNRM about road closures prior to the commencement of construction works.

To address the additional travel distances due to the proposal to lengthen the route from Muldu and Acland south-west to Jondaryan, I have set a condition requiring the proponent to provide alternative access travelling south-west from Acland to Jondaryan. As roads in this area are largely unsealed, I require this access to be spray sealed and maintained in accordance with Part 2, Pavement Structural Design, of the Ausroads standard.

In accordance with detailed road closure procedures, notification of road closures will be conducted during pre-construction sign-off at the detailed design stage. Notification is intended to occur following thorough assessment of the proponent's RIA by DTMR and TRC. I note the proponent has consulted with Queensland Police Service in relation to travel distances for emergency services.

5.4.2 Rail transportation

Rail movements from the project will increase from the current 53 trains per week to up to 80. However, the total number of trains along the West Moreton line will not increase in the short term because of the reduction of rail transportation by other freight users. Therefore current network efficiencies of the West Moreton line will be maintained. In the long term, upgrades to the West Moreton rail system and rolling stock by Queensland Rail and Aurizon may be required.

The proponent is required to gain approval from DTMR under section 55 of the *Transport (Rail Safety) Act 2010* to construct the rail spur and loop to connect with the existing West Moreton line.

5.4.3 Aviation

The Oakey Army Aviation Centre is approximately 9km south of the project site. The project has the potential to interfere with aircraft communications, flight paths and navigation if it is not appropriately designed and managed. The Army's concerns included potential light pollution, dust and vibration from mine blasting, and training and low-level flight restrictions over the mine.

Management and mitigation measures

The proponent has designed the project in accordance with the State Planning Policy and the Toowoomba Regional Council Planning Scheme provisions which guide development in the vicinity of aviation facilities. The provisions restricting the height of buildings and structures, and controlling lighting and emissions from the mine are of particular relevance to the project.

The aviation hazard management plan (AHMP) in the EIS aims to address the Army's concerns and outlines mitigation and management measures, including:

- controlling night lighting by screening and orienting lights inwards
- employing dust mitigation measures to control dust from project activities
- ongoing monitoring of all activities likely to impact the Army's operations
- establishing a community liaison officer to be a facilitator between the Army and the proponent to ensure all operational concerns can be addressed.

The tallest component of the project will be the out-of-pit dumps at 45m, which is below the specified height restriction of 90m.

5.4.4 Coordinator-General's conclusions

In evaluating road and rail transport impacts, I am satisfied that the proponent's assessment satisfactorily identifies that the project will generate additional traffic on state-controlled and local roads that will require upgrades to a number of intersections and level crossings. I have conditioned the proponent to upgrade affected intersections and to construct a new site access intersection in order to maintain an equivalent level of service for the road network. In the short term, my conditions further require the proponent to obtain pre-construction approval from DTMR and TRC on all roadwork's and improvements.

Additional travel distances will be incurred by some residents travelling from Jondaryan to Acland due to proposed road closures and realignments. To mitigate this, I have set a condition requiring a new access road be created and sealed.

In the short term there will be no worsening of the current performance the West Moreton rail line. In the long term, upgrades to the West Moreton line and rolling stock may be required by Queensland Rail and Aurizon.

I am satisfied the proponent has adequately considered the Oakey Army Aviation Centre during project planning and that implementation of the AHMP and consultation with the Australian Army will ensure operational airspace is not adversely impacted.

Based on the mitigation and management commitments included in the EIS and AEIS, as well as implementation of the conditions I have set, I conclude that impacts on all transport networks will be effectively managed to ensure that no worsening of current network conditions occurs.

I note the proponent's commitment to engage with various transport authorities during the construction and operational phases of the project to achieve this outcome.

5.5 Jondaryan rail load-out facility

In response to concerns raised by the local community through the EIS process about noise and dust and truck movement impacts from the mine's existing Jondaryan Rail Load-out Facility (JRLF), located 1km from the town of Jondaryan, the proponent proposes to construct a new train load-out facility (TLF) on the mine site, 8km north of Jondaryan and decommission the JRLF.

The new TLF for the project will be constructed to the south of the MLA, and will link into the existing West Moreton rail system. NAC anticipates a two-year construction period will be required to complete and commission the new rail spur and its associated infrastructure. Environmental impact considerations of the new TLF have been considered in this report.

EHP regulates an environmental authority for the existing JRLF, which states conditions on matters including minimising noise and dust impacts, and decommissioning of the JRLF site. Therefore, this report does not assess the JRLF's existing operation.

To ensure the timely construction of the new train load-out facility, I have set a condition that the new TLF will be the sole distribution point for all railed product produced by the project, from the day of first operations of stage 3.

It is my expectation that after hours activities at the JRLF would cease once the new TLF is operational. Decommissioning of the JRLF site is a matter within EHP's jurisdiction as regulator for the site's existing approval.

Coordinator-General's conclusions

The relocation of rail load-out facility away from the Jondaryan township will positively benefit the residents of Jondaryan. The condition I have set requiring that the TLF must be the sole distribution point for all coal from the day of first operation of the stage 3 project provides certainty about the time by which use of the existing rail load-out facility will cease.

5.6 Ecology

5.6.1 Terrestrial ecology

This section only *Nature Conservation Act 1992* (Qld) addresses impacts on matters of state environmental significance (MSES) that are not protected under the EPBC Act. For my evaluation on MSES that are also protected under the EPBC Act, refer to the MNES assessment at Section 8 of this report.

The project site has historically been cleared to support grazing and cropping. Remnant vegetation exists in riparian areas associated with Lagoon Creek and near locations of previous farm houses. The project site is largely degraded with a high degree of habitat fragmentation and isolation, and infestations of pest plants and animals.

Lagoon Creek is an ephemeral waterway that bisects the project site from its headwaters to the north of the project site. Diversion of Lagoon Creek is not proposed as part of the revised project.

For 13 years, the proponent has undertaken MNES and MSES flora and fauna surveys of the project site and other areas included in the NAC Mine tenements. DEHP and DE jointly reviewed and confirmed the suitability of the survey methodologies, which are discussed in Section 8 (MNES).

Vegetation and flora

Vegetation communities

A total of 144.4ha of remnant vegetation under the VM Act will be cleared, including three endangered areas, five areas of-concern and a single area of least-concern regional ecosystem (RE). Residual impacts on each RE, not including of least concern, are presented in Table 5.3.

Table 5.3 Residual impacts on MSES REs

RE description	RE identifier	VM Act status	Area cleared (ha)
<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	11.3.1	Endangered	12.0
<i>Eucalyptus populnea</i> woodland on alluvial plains	11.3.2	Of concern	6.0
<i>Eucalyptus populnea</i> woodland with <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> on alluvial plains	11.3.17	Of concern	5.8
<i>Dichanthium sericeum</i> and/or <i>Astrebla spp.</i> grassland on alluvial plains – Cracking clay soils	11.3.21	Endangered	35.9
<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	11.8.11	Of concern	4.1
<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on fine-grained sedimentary rocks	11.9.5	Endangered	12.6
<i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> open forest on Cainozoic fine-grained sedimentary rocks	11.9.10	Of Concern	4.1
<i>Eucalyptus moluccana</i> of <i>E. macrocarpa</i> open forest on fine grained sedimentary rocks	11.9.13	Of Concern	3.6
Total area of REs			84.1

In addition to the above, semi-evergreen vine thicket on Cainozoic igneous rocks (RE 11.8.3) also occurs on the project site, but this species will not be cleared. As MNES, this RE has been addressed in section 8.

According to the Environmental Offsets Regulation 2014, endangered and of-concern REs on the project site are considered as MSES. The greatest impact to MSES is on *Dichanthium sericeum* and/or *Astrebla* species grassland on alluvial plains (RE 11.3.21), as 35.9ha of this RE occurs within the disturbance footprint of the project.

Flora species

Field surveys identified three plant species of conservation significance on the project site:

- (a) finger panic grass (*Digitaria porrecta*)
- (b) Belson's panic grass (*Homopholis belsonii*)
- (c) austral cornflower (*Rhaponticum australe*).

Approximately 101ha of confirmed finger panic grass will be cleared within the Manning Vale West pit disturbance area. Finger panic grass is listed in the NC Act as near-threatened and does not qualify as MSES.

Austral cornflower, listed as vulnerable under the NC Act, was found in areas adjacent to the rail spur on MLA (infrastructure) 700001, but the revised location of the proposed rail line and balloon loop will avoid impacting this species.

Belson's panic is endangered under the NC Act and listed as vulnerable for the purposes of the EPBC Act. The project will impact up to 70.8ha of this species. Belson's panic was recorded within 12 remnant and non-remnant habitats within the disturbance footprints of the Manning Vale West Pit and the Willaroo Pit to the south of Lagoon Creek. This species was found in the shelter of trees in the Brigalow and poplar box vegetation communities (RE 11.3.21 and 11.8.11).

As austral cornflower and Belson's panic are both MNES threatened species, these matters are discussed in section 8.

Management and mitigation measures

I have stated a condition requiring the proponent to undertake detailed pre-clearance ecological surveys to confirm the presence of endangered, vulnerable and near-threatened plant species (EVNT plants) and their supporting habitat. Flora survey trigger maps determined that clearing on the project site would occur within an area defined as high risk for the purposes of the NC Act. These activities will require permits in accordance with the NC Act.

If protected plants are found during pre-clearance surveys, then impacts may require a permit under the NC Act and offsets under the *Environmental Offsets Act 2014*.

During construction, the proponent has committed that vegetation outside the revised project disturbance area will not be cleared or impacted. Furthermore, all areas to be cleared will have their boundaries surveyed, with particular attention to endangered and of-concern REs.

To minimise impacts on terrestrial flora during construction and operation, the proponent has committed to implement an Environmental Management (EM) Plan. Sub-plans included in the EM plan include a:

- Threatened Species Translocation Plan (TSTP)
- Final Land Use and Rehabilitation Plan (FLURP).

The TSTP describes the sites south of the project site where the species will be relocated to, how the translocation will be completed and monitoring of the plan's implementation. The plan provides for translocation of Belson's panic grass.

During construction and operation, the active mining pit areas, out-of-pit dumps, the slopes of depressed landforms and mine infrastructure will be progressively cleared and rehabilitated. The FLURP outlines the general rehabilitation procedures proposed to return the disturbance areas to their previous land use of grazing with scattered areas of native tree species. Therefore, impacts on terrestrial flora represent a short to medium-term impact.

I have imposed a condition requiring the proponent to submit a revised environmental offset strategy (EOS) to relevant parties to satisfy State and Federal requirements for the clearance of environmentally significant vegetation and flora within the project site. The EOS will document the actions required to secure and manage offsets for EVNT flora species under both the NC Act and EPBC Act.

The proponent has prepared sub-plans to the EM plan that present appropriate actions to effectively manage all clearance, offset and translocation activities. To limit impacts on REs, I have set maximum allowable clearance limits, provided in Table H4 of the draft EA conditions in Appendix 2.

Coordinator-General's conclusion

Impacts on listed threatened flora species under the NC Act will likely be confined to Belson's panic and finger panic grass. Impacts on austral cornflower will be avoided by the proponent. The only MSES listed flora species is Belson's panic. Table H4 of the draft EA conditions state that the maximum authorised impact on this species is 70.8ha and this will be offset under the EPBC Act. Appropriate management actions of all other flora species will be provided in conditions for any future clearing permits under the NC Act.

Impacts on vegetation communities and flora species will be minimised by implementing the mitigation measures outlined in the EIS, AEIS and EM plan. Draft EA conditions provide requirements for post-mining decommissioning and rehabilitation and present the maximum authorised area of impact on endangered and of-concern REs and MSES. The draft EA condition set is included at Appendix 2.

I am satisfied that, once finalised and implemented, the EOS will adequately satisfy the State and Federal offset requirements for the clearance of environmentally significant vegetation and flora within the project area.

Terrestrial fauna

The little pied bat (*Chalinolobus picatus*), the painted honeyeater (*Grantiella picta*) and the koala (*Phascolarctos cinereus*)—each listed under the NC Act—were identified during field surveys.

The little pied bat is classified as a near threatened species in the NC Act, however its habitat is not classed as MSES and therefore does not require an offset. This species was recorded once in the project area, but not during subsequent targeted surveys. I require that the little pied bat be considered in the Fauna Management Plan to avoid impacts during clearing activities.

The painted honeyeater is classified as vulnerable under the NC Act and therefore its habitat is MSES. The painted honeyeater was observed only once in riparian habitat along Lagoon Creek, but was not recorded during subsequent targeted surveys. The proponent advised that areas suitable for painted honeyeater foraging will be removed, however areas suited to the bird will be retained and enhanced through the Lagoon Creek Conservation Zone Management Plan (CZMP).

Koalas

Koalas were the only MSES species identified during targeted surveys. Evidence of koala activity, in the form of scats and scratches in poplar box communities, was recorded on the site during a koala survey in 2013. Koalas are classed as special least concern under the NC Act and the project site contains scattered koala habitat.

The project requires the clearing of known koala refuge and feeding habitats (of-concern REs 11.3.2, 11.3.17, 11.9.10 and 11.9.13) resulting in a residual impact to koala habitat of 19.5ha. There is potential risk of harm to koalas during vegetation clearing, and construction and operation of the project.

Mitigation and management measures

Avoidance, mitigation, management and monitoring measures for the koalas and their habitat are described in the proponent's proposed Koala Species Management Plan (KSMP).

I have set conditions requiring the proponent to submit a revised KSMP that is consistent with the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006–2016 (Environmental Protection Agency 2006) to DEHP for approval. The revised KSMP is required to specifically address measures such as:

- the staging or limiting of vegetation clearance
- the use of an experienced koala spotter to locate fauna prior to clearing of habitat and allow their safe dispersal
- the identification of fauna movement corridors and the use of exclusion fencing around operational mining areas or transport routes.

Coordinator-General's conclusions

Some MSES species, including the little pied bat and the painted honeyeater, were previously recorded in the project area or may occur in the project area based on suitable habitat. Therefore, I have set a condition requiring pre-clearance surveys for fauna prior to construction. Surveys must include areas of potential habitat for the painted honeyeater. The proponent may need to revise its offset requirements if the pre-clearance fauna surveys detect additional threatened/listed species. These surveys will also be required for any off-mining lease activities, for example, road diversions and powerlines.

I have also stated conditions to authorise a maximum impact area of 19.5ha for koala habitat. Commonwealth offsets for MNES do not overlap for impacts on known koala habitat (of-concern REs 11.3.2, 11.3.17, 11.9.13, and 11.9.10). Therefore I have stated a condition requiring an offset for significant residual impacts on these REs in accordance with the requirements of the *Environmental Offsets Act 2014*, the *Environmental Offsets Regulation 2014* and *Environmental Offsets Policy 2014*.

I have imposed a condition requiring the proponent to include details of where and how offsets for koala habitat will be sourced within the EOS. The koala habitat offset should be provided through a land-based offset to ensure a local conservation outcome for koalas. I have also imposed a condition to ensure the delivery of a KSMP meets the requirements of the NC Act.

I am satisfied potential impacts on koalas and their habitat will be avoided, minimised and mitigated to an acceptable level through the revised KSMP, proponent commitments and my conditions.

Conservation zone buffer

The riparian zone of Lagoon Creek contains a large amount of ecologically significant remnant vegetation that provides habitat for koalas and a nature corridor and refuge for numerous other fauna species.

The proponent has committed to rehabilitate the Lagoon Creek conservation zone area to mitigate water quality impacts, potentially reduce erosion and sediment impacts, and restore REs and habitat. The proponent will manage a conservation zone, including areas 50m either side of Lagoon Creek, in accordance with the CZMP.

Pre-clearance vegetation mapping from the Queensland Herbarium confirmed that RE 11.3.17 was the historical RE associated with Lagoon Creek. In order to enhance the environmental values within the conservation zone, I have set rehabilitation targets in line with its original RE status. The objective of the rehabilitation is to provide habitat for fauna, particularly for koalas, and improve connectivity for other fauna species. The main components of the CZMP include:

- revegetation and management goals/objectives
- planned revegetation techniques
- rehabilitation acceptance criteria
- a monitoring and reporting regime
- a maintenance regime for weeds
- a comprehensive long-term management regime.

Coordinator-General's conclusion

I am satisfied with the proponent's proposal not to divert Lagoon Creek and its commitment to conserve and rehabilitate remnant vegetation 50m either side of the creek. I have stated conditions in the draft EA that confirms the buffer area and sets rehabilitation targets for the Lagoon Creek conservation zone. I require the proponent to rehabilitate the conservation zone in accordance with a revised CZMP. I have imposed conditions requiring the proponent to meet the Lagoon Creek rehabilitation targets which specify the minimum percentages to be achieved for matters including native plant species and native perennial grass cover.

To realise the full benefits of the Lagoon Creek conservation zone, rehabilitation of the creek corridor should occur as soon as possible. I have set conditions requiring this to occur within 2 months of the issuing of the project's EA and mining leases. I require the proponent to ensure no net loss of the buffer area, should water treatment ponds or dams need to be constructed within the conservation zone.

While managed cattle grazing will help to control weed spread in the creek, the proponent must ensure areas are successfully revegetated and not compromised by over-grazing. Appropriate control and management of stock will be required to uphold the creek's function as a fauna corridor. This may involve the use of fences and other infrastructure to promote the use of the corridor by fauna.

Pest plants and animals

The *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) regulates the management of pest plants and pest animals in Queensland. Four declared class 2 pest plants and five declared class 2 pest animal species were recorded on the project site, as described below in tables 5.4 and 5.5.

Table 5.4 Declared pest plant species

Common name	Scientific name	Occurrence	Declared status (LP Act)
Mother of millions	<i>Bryophyllum delagoense</i>	Uncommon, localised distribution.	Class 2
African boxthorn	<i>Lycium ferocissimum</i>	Scattered distribution in grazing lands of the study area, usually within disturbed remnant vegetation.	Class 2
Velvet tree pear	<i>Opuntia tomentosa</i>	Occurs in low-moderate abundance within most areas of remnant vegetation in the study area.	Class 2
Prickly pear	<i>Opuntia stricta</i>	Occurs in low abundance, not as common as velvet tree pear.	Class 2

Table 5.5 Declared pest animal species

Common name	Scientific name	Occurrence	Declared status (LP Act)
Fox	<i>Vulpes vulpes</i>	Identified on the project site	Class 2
Feral pigs	<i>Sus scrofa</i>	Identified on the project site	Class 2
European rabbit	<i>Oryctolagus cuniculus</i>	Identified on the project site	Class 2
Wild dog	<i>Canis familiaris</i>	Identified on the project site	Class 2
Feral cat	<i>Felus catus</i>	Identified on the project site	Class 2

Mitigation and management measures

The proponent has committed to implement a Pest and Weed Management Plan (PWMP). The plan presents an integrated approach to managing declared pest plant infestations and includes the use of controlled burns, manual removal and herbicide application to reduce weed infestations. It identifies integrated pest management treatments, including baiting, trapping and shooting, to adequately control class 2 pests.

Coordinator-General's conclusion

I am satisfied that the implementation of the PWMP will adequately minimise the potential spread of pest plants and animals from the project. The preparation of the PWMP demonstrates that the proponent is aware of its obligations under the LP Act.

5.6.2 Aquatic ecology

The study area for aquatic ecology was located downstream of the mine and focused primarily on Lagoon Creek. The creek is located in the Oakey Creek sub-catchment of the upper Condamine River catchment and feeds into the Murray Darling Basin.

Field surveys found that past land uses have resulted in a moderately disturbed aquatic environment, with limited in-stream habitat, degraded water and exotic weed species. Lagoon Creek has a low diversity of aquatic animal and plant life.

Although 16 species of aquatic flora were identified during a desktop review, no EVNT or special least-concern species were located during on-site surveys. Fourteen fish species are known to occur in the surrounds of the study area. No species of conservation significance were confirmed during surveys.

Macroinvertebrate species were recorded in the project area, although none are listed as EVNT or have local or regional significance.

The desktop review identified three species of turtle potentially present in the study area, but none are EVNT or special least-concern species. Two turtles were sighted during surveys—one could not be identified and the other was the eastern snake-necked turtle. Given the degraded habitat of Lagoon Creek, the EIS suggested the creek is unlikely to support large populations of turtle species.

Potential impacts on aquatic ecology values could arise from project activities during construction or operation. Impacts could include erosion, changes to water quality or flow regimes, loss of habitat, introduction of pests and harm to fauna.

Mitigation and management measures

To reduce impacts on aquatic flora and fauna, the proponent has committed to implement a range of mitigation measures, many of which are included in the EM Plan. Key measures include:

- erosion management in areas of infrastructure development potentially affected by run-off
- revegetation of disturbed areas no longer required for operations
- controlled releases of mine water
- construction of flood levees
- fuel and chemical storage procedures to reduce risk of spill
- appropriately designed and constructed crossings of Lagoon Creek that consider its hydraulic behaviour, fauna movement and existing locations of crossings.

The Lagoon Creek conservation zone buffer area and rehabilitation strategy will also enhance riparian values.

The proponent has committed to conducting more detailed sampling of aquatic environmental values including water quality prior to construction. This will establish baseline conditions and prepare a receiving environment monitoring program. The proponent has also committed to monitor aquatic flora and fauna before, during and after construction.

Coordinator-General's conclusion

The potential aquatic ecology impacts have been adequately identified in the EIS and AEIS. The proposed mitigation strategies and conditions I have stated in the draft EA will ensure impacts on water quality and aquatic flora and fauna are managed to acceptable standards.

In constructing the haul road over Lagoon Creek, the proponent is required to abide by the directions included in the Queensland Government *Guideline – Activities in a Watercourse, Lake or Spring associated with Mining Activities*.

I have conditioned that the haul road crossing of Lagoon Creek must not significantly impede the ephemeral flow regime or create a barrier during periods of flow within the creek.

5.7 Waste

5.7.1 General waste

The EIS predicted that a number of general waste streams would be produced during construction, operation and decommissioning of the project, including:

- regulated wastes, including hydrocarbon waste such as liquids and oils—waste oils (220 tonnes per annum [tpa]); greases (52tpa); oil filters and absorbents (10.5tpa); anti-corrosion agents (radiator fluid/coolant) (50tpa); vehicle batteries (120tpa) and tyres (750tpa)
- standard waste, including food waste, some plastics and paper (190tpa)
- recyclables, including paper, cardboard, plastics, glass and aluminium cans (150tpa)
- scrap metal and off-cuts from maintenance activities and the construction of infrastructure, including the TLF and CHPP
- sewage effluent and sludge (25ML per annum and less than 1tpa respectively)
- decommissioning waste during the several years of rehabilitation of the mining lease, including concrete (less than 5,000t); electrical waste (e.g. cabling) (600t); steel and metal offcuts (2,000t)
- around 146ha of vegetation to be cleared from disturbance areas.

Management and mitigation measures

Waste management strategies for the project will be consistent with the intent of the waste management hierarchy as defined in Schedule 1 of the Environment Protection (Waste Management) Policy 2000, being, in order of preference:

- waste avoidance
- waste re-use
- waste recycling
- energy recovery from waste
- waste disposal.

The proponent has prepared a Waste Management Plan (WMP) for the project, which includes the following strategies:

- minimise scrap metal by producing or procuring only the amount required and ensuring all re-usable steel is sold and removed from site appropriately
- licensed and certified contractors will remove, track and record any regulated waste such as hydrocarbons and contaminated waste
- general wastes will be regularly collected and transported to the Oakey landfill by a licensed waste transporter
- recycled materials will be transported to a local material recycling facility
- re-use of vegetation and garden/green waste
- separation of oil and water from the wash-down bay for water treatment and sludge collection and removal.

Some waste products, such as tyres and wooden packing and pallets, will be disposed of in the mine pits post-mining. I have stated conditions that such practices must not impede or pollute saturated aquifers, compromise the stability of the consolidated landform or pose a risk to mine safety. I have stated conditions for disposing of tyres in pits. Tyres are required to be placed deep in the pits and must not pose a fire risk.

Sewage treatment plant

While the current operation has an operational sewage treatment plant (STP1) on site from which treated effluent is used for dust suppression, a new STP (STP2) will be constructed to accommodate a greater number of people on site. STP2 will have an additional capacity of 250 persons.

All sewage from construction areas and offices will be treated on site at STP2, with the treated effluent drained to an on-site sediment dam and re-used.

To protect the health and wellbeing of people and the environment, both on and off the project site, I have stated conditions to control the reuse and disposal of treated sewage effluent, inclusive of:

- monitoring of effluent to ensure it adheres to contaminant targets before being used for dust suppression and irrigation; treated effluent is not to be sprayed over a sensitive place; and no sewage effluent is to be directly discharged to waterways.
- during period of flows when sediment dams containing effluent are full, any release to receiving waters must comply with release limits for chemical properties provided in the stated conditions.

Acland tip

The EIS confirmed that the Acland tip, located 1.5km east of the town of Acland, is in the footprint of the Manning Vale East mine pit. The tip was used from 1977 to 2008 and contains around 61,500m³ of waste material, mostly made up of building and domestic waste, compacted into soil. The tip is listed on the State Government Environmental Management Register.

Prior to relocation of the tip, a suitably qualified person must be engaged to determine the nature and extent of any contamination and how any contaminated material can be safely contained on site. A soil disposal permit under the EP Act would be required to move contaminated material off site. The proponent would also need to notify DEHP where the material had been relocated to.

Coordinator-General's conclusion

I am satisfied that the potential impacts of general waste can be adequately managed through the conditions I have stated and through the proponent's commitments. I am satisfied that developing and implementing a WMP will improve waste management practices and reduce the project's potential waste management risks.

5.7.2 Mine waste

Open-cut mining will involve stripping overburden and interburden to access the coal resource. The total predicted volume of mine waste for the life of the project includes approximately 237 million bank cubic meters (Mbcm) of overburden and 218Mbcm of interburden. During the rehabilitation of mine voids, approximately 396Mbcm of mine waste will be disposed of in pits, with about 50Mbcm placed in out-of-pit spoil dumps.

Tailings, the fine particles produced after processing and washing coal, are estimated to equate to around 27Mt (21Mm³) for the life of the mine. Tailings will be disposed of in in-pit tailings disposal facilities.

Waste rock impacts

Geochemical analysis conducted as part of the EIS concluded that the bulk of overburden and interburden is likely to be non-acid forming (NAF) waste.

Key results from the geochemical reports found:

- the majority of samples analysed are considered to be NAF
- a smaller number of samples were classified as potentially acid forming (PAF) and low capacity PAF (PAF-LC)
- weathered mine waste will be saline
- non-weathered mine waste will have low salinity
- most samples analysed have neutral to mildly alkaline pH, however some samples of PFA and PAF-LC waste, including carbonaceous shale, may have slightly acidic pH
- the potential for poor soils is generally moderate.

There have been no incidences of acid drainage at the mine since operations commenced. Surface water quality monitoring data from 10 years of operations indicated that the alkaline nature of some of the overburden and interburden provides a significant neutralising effect against any PAF waste. Additionally, while testing confirmed minor occurrences of metals and metalloids in waste rock, these have not been apparent in water quality data.

Tailings impacts

The current mine's tailings strategy involves progressively constructing in-pit tailings cells. This practice will continue for the project, reducing the disturbance footprint.

Once tailings have settled in dams, water will be recovered from these areas. The EIS stated that around 50 per cent of water (around 4,460ML per annum) could be reclaimed and re-used as required.

These tailings dams will need to be contained to avoid leachates escaping, structurally safe and adequately bunded to avoid contamination escaping during flood events.

Mitigation and management measures

The proponent has committed to develop strategies and management plans, including:

- developing a mine waste characterisation and management strategy
- storing and containing wastes and surface water diversions around waste storages by installing appropriate levee/bunding structures
- ongoing evaluation and testing of mine waste material to identify any adverse impacts of the storage or use of mine waste for use in land rehabilitation, or in-pit tailings storage facility (ITSF) tailings water being re-used at the CHPP
- monitoring and ongoing review of mine waste as part of the WMP and EM Plan
- including mine waste management strategies in the ITSF and Topsoil Management Plan
- for post-mining rehabilitation, capping tailings storage facilities with inert material, applying topsoil and revegetating.

I have stated specific conditions to ensure the handling, storage and use of mine waste does not cause environmental harm.

Coordinator-General's conclusions

Based on the proponent's commitments to handle, store, dispose of and re-use mine waste (as described in the management plans provided in the EIS), as well as adherence to the conditions I have stated, I am satisfied that the effective management of mining waste over the life of the project can be achieved.

5.8 Hazard and risk management

A hazard and risk assessment was undertaken in accordance with principles set out in Risk Management – Principles and Guidelines (Australian Standard/New Zealand Standard AS/NZS:ISO 3100) and Risk Management Guidelines Companion to AS/NZS 4360:2004 (HB436:2004).

The EIS identified 43 potential hazards for the life of mine. These were assessed to rate the consequence, likelihood and outcome that may result should the hazard be realised. For each hazard, preventative and protective controls (such as dust suppression on roads and truck washing to prevent the introduction of weeds) were considered.

Most potential hazards were assessed as low to medium risk and no extreme risks were anticipated. The following were considered high risk issues for the project:

- noise generation
- dust
- groundwater management
- mine water runoff
- hydrocarbon leaks
- pest, plant and animal management
- safety risks
- fire
- run off from tailings
- dam failure
- clearing of rare and endangered ecosystem.

5.8.1 Mitigation and management measures

Mitigation measures were informed by relevant statutory and regulatory obligations including:

- *Work Health and Safety Act 2011*
- Work Health and Safety Regulation 2011
- *Explosives Act 1999*
- *Coal Mining Safety and Health Act 1999*
- Coal Mining Safety and Health Regulation 2001.

As with existing mining operations, the proponent will continue to apply its Risk Management Policy and Strategic and Corporate Risk Management Framework to hazard and risk management strategies and controls for the project.

Management plans developed for the project to minimise and manage hazards and risks include:

- Emergency Management Plan
- Aviation Hazard Management Plan
- Pest and Weed Management Plan
- Groundwater Monitoring and Impact Management Plan
- Air Quality Management Plan
- Noise and Vibration Management Plan
- Waste Management Plan
- In-pit Tailings Storage Facility Management Plan
- EM Plan (which, as well as addressing elements of the above, also includes nature conservation and cultural heritage management and harm mitigation).

Hazard and risk management strategies have considered public health, safety and community values. I have further considered these matters in section 7, Social impacts.

Plans will be regularly reviewed and updated to ensure hazards and risks are managed, and compliance with legislative requirements is maintained.

Emergency Management Plan

The proponent has committed to continue reviewing the existing mine's Emergency Management Plan and to implement the plan as applied to the project. The proponent has developed emergency and evacuation planning and response procedures in consultation with state and regional emergency service providers.

Proponent commitments for controlling and managing emergencies include:

- the provision of a first aid service and fire fighting services
- the establishment and maintenance of contingencies to respond to emergency situations, including consultation with regional emergency service providers
- conducting periodic emergency simulation drills with local emergency service providers over the life of the project, including auditing and reviews
- targeted hazard and risk mitigation and management strategies and procedures to avoid harm to people and the environment.

5.8.2 Coordinator-General's conclusion

Extensive legislative requirements are in place that require hazard and risk management to drive business practices at the site. This informs the management of potential hazards and risks that may occur both on and off site.

By implementing the proponent commitments and the above management plans, I consider that the potential hazards and risks for the project will be adequately managed throughout the life of the project.

5.9 Cultural heritage

5.9.1 Indigenous cultural heritage

The *Aboriginal Cultural Heritage Act 2003* (ACH Act) protects Indigenous cultural heritage (ICH) in Queensland. To comply with the duty of care provisions under section 23 of the ACH Act, proponents of projects requiring an EIS must prepare a cultural heritage management plan (CHMP) prior to commencing construction. The CHMP is a legally binding agreement between the proponent and native title claimants and details the procedures for identifying and managing potential impacts on ICH.

The Western Wakka Wakka Endorsed Parties are the statutory native title claimants for land within mining development lease 244. In accordance with the ACH Act, a CHMP and a cooperation agreement are in place for existing mining activities on mining lease 50170 and mining lease 50216.

As required under Part 7 of the ACH Act, on 21 October 2014 the proponent negotiated a revised CHMP with the Western Wakka Wakka Endorsed Parties. The document was lodged with the Department of the Aboriginal and Torres Strait Islander and Multicultural Affairs (DATSIMA) and was approved on 2 December 2014. The revised CHMP includes mining activities on MLA50232, construction of rail facilities on MLA (infrastructure) 700001 and other off-lease land areas for associated utilities and road upgrades.

In addition to preparing the CHMP, the proponent has committed to cultural heritage awareness training for all personnel and contractors throughout each stage of the revised project. ICH commitments are included in the AEIS and detailed procedures are in the proponents EM Plan.

Coordinator-General's conclusions

The revised CHMP satisfies the duty of care requirements under the ACH Act and NT Act and details processes for identifying and managing ICH places and objects. I am satisfied with the proponent's assessment of ICH in the EIS and AEIS and I conclude that any potential impacts can be appropriately managed throughout the life of the project.

5.9.2 Non-Indigenous cultural heritage

The EIS and AEIS identified 12 non-Indigenous cultural heritage (NICH) sites either within or in close proximity to the project area. Such sites characterise the kinds of heritage values typical of the region relating to early mining, settlement, and agricultural activities. The locations of the 12 heritage sites are presented in the EIS.

Previous plans to remove or relocate significant components of NICH sites, such as the Acland war memorial, located in the Tom Doherty park, and the State heritage-listed Acland No. 2 colliery, were abandoned when the proponent reduced the project's scope in 2012. Five items previously included on the list of 12 NICH significant sites now fall outside the boundary of MLA50232. The proponents proposed measures to maintain local heritage items are contained within the Acland Management Plan.

One of the five NICH sites was the Acland No. 2 Colliery. To date, this site remains registered as a place of heritage value on the Queensland Heritage Register (register no. 602599) and as a place of heritage value on the non-statutory National Trust of Queensland Heritage List (ROS 7/0). The proponent owns the land on which the Acland No. 2 Colliery is located, and the EIS confirmed the proponent's obligations under the *Queensland Heritage Act 1992* to maintain and preserve the heritage significance of the site.

The township of Acland also contains items of local historical or heritage importance. The proponent has committed to preserve and maintain 13 of the 23 historical items identified in the Acland township as part of the Acland Management Plan (AMP) included in the EIS. Other items identified in the town have been removed by the proponent, with the proponent citing some buildings were in disrepair or unsafe. Other

items will be donated for beneficial use elsewhere. The AMP is also discussed in section 7 of this report.

Table 5.6 shows the NICH items that remain on the project site.

Table 5.6 NICH sites and values occurring within the project area

NICH site	Proximity to project area
The agrarian landscape	General NICH value of the wider region and project site
Sugarloaf mine	Approximately 1km west of the Willeroo pit
Acland No. 1 (Beith mine)	Approximately 2km west of the Willeroo pit
Willeroo No. 2 mine	Approximately 500m south of the Willeroo pit
Summer Hill Hotel site	Approximately 600m east of the Manning Vale West pit
The Oakey to Cooyar railway line	Traverses the MLA50232 in a north-easterly direction
Wells' graves and the former Presbyterian Church site.	Approximately 200m east of the Manning Vale East pit

I note that the EIS identified the agrarian landscape as a heritage value. I have assessed land impacts, including setting conditions requiring the proponent to rehabilitate disturbed land to the best possible agricultural land use in Section 5.1 of this report.

Although none of the 12 heritage sites identified in the EIS will be directly affected by the mine pits or new infrastructure, over the life of the mine there is a potential to inadvertently disturb these, or newly discovered items of NICH. The potential for impacts on NICH will increase during vegetation clearing and ground disturbance activities.

The potential impacts of clearing and ground disturbance activities would be managed under the *Queensland Heritage Act 1992* (QH Act), which protects artefacts and NICH values. Part 9 of the QH Act requires persons to notify the chief executive of the administering authority if they discover archaeological artefacts. To ensure its duty of care in complying with the QH Act, proponents of major development projects prepare NICH plans. The plans apply to both the construction and operational phases and establish the processes for identifying NICH items prior to disturbance activities commencing on site and ways by which project works can avoid and/or minimise impacts on any identified NICH items.

Coordinator-General's conclusions

I am satisfied that the EIS sufficiently addressed impacts on NICH at the project site. To minimise impacts on NICH values throughout the life of the mine, the proponent has identified obligations to achieve compliance with QH Act. I am satisfied that the proponent will manage potential impacts on NICH items and will ensure all relevant duty of care provisions in accordance with the QH Act are fulfilled.

6. Economic impacts

6.1 Methodology

The project's economic impact assessment used the 'input output' method to analyse the project's potential impacts. This assessment methodology is acceptable where direct and indirect positive and negative impacts can be directly attributed to the project.

The 'input output' assessment methodology for this project has been modified to specifically exclude any elements that could overstate the economic benefits for this project.

6.2 Impacts

6.2.1 Employment

For the two-year construction phase, the project would support up to 260 jobs at peak. During the 12-year operations phase, the project would directly employ up to 435 people—an increase of 135 direct jobs from the mine's current operation.

The proponent has committed to recruit local and regional workers for the project where possible. Based on the NAC mine's current experience, the proponent anticipates 95 per cent of the workforce would live within the regional study area, from locations such as Oakey, Jondaryan and Toowoomba; while the remaining five per cent of workers would be based in Brisbane and regional areas.

6.2.2 Economic outputs

For construction, the total direct project expenditure is estimated at \$900 million. For the operations phase, direct economic expenditure would be in the order of \$5.7 billion.

In considering both direct and indirect economic impacts of the project, the total output at the state and national level is estimated at \$1.9 billion for the construction phase and \$10.6 billion during operations.

From these figures, the proponent identifies that a total of \$547 million during construction and \$2.7 billion during operations is estimated to be retained in the regional study area.

The maximum positive household income impact across Queensland (direct and indirect) is estimated at approximately \$348 million from construction expenditure, with approximately \$2.9 billion from operational expenditure (life of project).

Of these amounts, approximately \$75.7 million is estimated to remain in the regional study area from construction and approximately \$1 billion is estimated to remain in the regional study area from the operations phase.

6.2.3 Impact on agricultural economic output

Post-mining, the proponent proposes to return the majority of the land to grazing, which will represent a reduction from its higher potential use as cropping land.

The AEIS states the total negative economic impact of the down-scaling of the land's potential use following the completion of mining, as well as including agricultural land that would be lost to any post mining production due to permanent mine voids, is estimated at just over \$30 million.

The modelled displacement of post-mining direct annual agricultural employment is estimated at 12 FTEs per year, with the indirect impact estimated at 7 FTEs per year.

6.3 Mitigation and management measures

6.3.1 Local and regional economic benefits

Estimated positive economic benefits for the local and regional study areas can be maximised through strategies to increase local worker and business participation in the project.

To maximise the opportunity of the project's economic benefits being retained locally and regionally, the proponent has committed to:

- adhere to the Queensland Resources and Energy Sector Code of Practice for Local Content
- include local purchasing provisions in the company's purchasing policy
- maximise local employment opportunities over the life of the project
- provide training and development opportunities for people locally and regionally.

I have considered the social impact of these matters in section 7 (Social impacts).

6.3.2 Agriculture

The proponent asserts that progressively rehabilitating land during the life of the mine's operation and post-closure will return the majority of impacted land to a state suitable for grazing production. The proponent currently runs cattle on rehabilitated land from its existing operation, with grazing trials underway to inform improvements to the management of rehabilitated land.

The proponent's commitment to return mined land to grazing and the conditions I have imposed in this report (requiring rehabilitated land to be returned to best possible agricultural use) will ensure land impacted by mining can contribute to the post-mining economy through continued agricultural use.

Other conditions I have set requiring the proponent to secure and improve, for agricultural production, equivalent land to that lost from the permanent mine voids, will also increase agricultural economic benefits for the region post-mining operations.

6.4 Coordinator-General's conclusions

I am of the view that the project presents economic and employment opportunities for the TRC area, the broader Darling Downs region and Queensland.

I am satisfied the 'input output' methodology took a conservative approach to understand the potential impacts on the local, regional, state and national economies.

During mining, the conditions I have set will work to enhance regional employment opportunities. Post-mining, I have set requirements to ensure that agricultural land impacted by the project will be able to return to its best possible productive use, providing ongoing economic benefits for the agricultural sector in the region.

7. Social impacts

7.1 Social impact assessment

A social impact assessment (SIA) was conducted as part of the EIS. The SIA addressed the principles of the *Social impact assessment guideline* (DSDIP 2013) and recognised the complementary guideline *Managing the impacts of major projects in resource communities* (DSDIP 2013).

The study area for the SIA included the TRC local government area and the key localities of Toowoomba, Oakey, Jondaryan and Acland. The SIA summarised the potential positive and negative impacts of the project and provided mitigation and management measures to address the impacts.

Potential positive impacts identified in the SIA include:

- maintaining current, and creating additional, direct and indirect local and regional employment
- continued provision of education and training opportunities
- increased procurement opportunities for local businesses
- preservation of sites of historical significance
- increased community support programs and initiatives.

Potential negative impacts identified in the SIA include:

- change of land use from agriculture to mining and impacts on rural amenity
- impacts from mining operations, including air quality, noise, vibration and water resources
- traffic safety and connectivity
- impact on local and regional housing markets
- increased demand for health and education services
- community concerns over the level of consultation and engagement processes and procedures.

The SIA identified that the proponent could do more to strengthen its social licence to operate in the community. The proponent has responded with a series of action plans which are detailed in the EIS.

7.2 Community and stakeholder engagement

To inform the SIA, the proponent undertook broad scale community and stakeholder engagement and consultation. While the community consultation strategy was broad and covered areas of potential social impacts, submissions about the EIS and the AEIS identified that the engagement and consultation strategy lacked depth. In particular, affected stakeholders were of the view that the consultation processes were not responsive to their needs. Most affected stakeholders did not find that they had a sufficient understanding of the mitigation and management strategies for critical impacts, particularly in relation to:

- management of air quality, dust and noise associated with the operation of the mine site and the JRLF
- vibration associated with blasting
- water resources—impacts on bores, water tanks, flooding and groundwater drawdown
- road closures and impacts for residents and landholders
- land use moving from agriculture to mining
- health impacts associated with dust and noise
- changes to the Acland township and the high level of impacts on the remaining landholder
- management of Acland Township, War Memorial, Tom Doherty Park and Acland Colliery No. 2 heritage site.

7.2.1 Management and mitigation measures

In response to stakeholder and community feedback, the proponent has proposed a detailed consultation, engagement and information process for the project.

In particular, the proponent has developed a structured approach to consultation and engagement, incorporating proactive strategies and commitments for communicating with stakeholders. This approach focuses on disseminating information that is directly relevant to the pre-construction, construction and operational phases of the project.

As part of the enhanced engagement mechanisms, landholders and residents across the study area have been divided into three categories:

- Category 1: High Priority Landholders—those who are potentially the most impacted as shown through environmental modelling
- Category 2: Landholders in close proximity to the mine with fewer potential impacts
- Category 3: Landholders who may have concerns or interests in the project.

These categories are based on the proximity of residents and the community to the project site and the range and degree of impact they could experience.

The revised engagement strategies and commitments include:

- using a wider choice of mechanisms to engage and consult with landholders and stakeholders
- providing straightforward project information to landholders
- regular timeframes for delivering information
- clarity about the detail of the information that will be provided for mitigation and management strategies to be adopted on critical issues raised by the community
- developing a personalised program of consultation and engagement for individual landholders that is specific to their property and issues of concern
- development and implementation of detailed complaints and disputes resolution plan
- wider communication strategies to enable the community to understand the improved processes and procedures to be adopted for consultation, engagement and information sharing
- re-establishing and implementing community engagement sessions.

To further assist in improving consultation and sharing information with the community, the proponent has already established the following mechanisms:

- landholder engagement protocols
- a community reference group made up of a broad cross-section of local and regional representatives
- a community information centre in Oakey
- complaint and dispute resolution policy and procedures
- quarterly newsletter and proponent website
- communication processes to inform all landholders and residents of the improved engagement consultation and information sharing approach to be adopted by the proponent for the life of the project.

The proponent has also developed and committed to a range of engagement and consultation strategies with local and state government agencies, business and community groups, both locally and regionally.

7.2.2 Coordinator-General's conclusions

I consider the consultation and engagement processes adopted by the proponent during the EIS were sufficient to identify community and stakeholder issues. I note the proponent's efforts to improve and increase the level of consultation, engagement and information sharing.

To ensure that the proponent's stakeholder consultation and engagement plan and complaints and disputes resolution plan are effective for the pre-construction, construction and operational phases of the project, I have set a condition requiring the

proponent to publicly report on these plans. The public reporting will be every six months during the pre-construction phase, annually on the construction phase and the first stages of operation, for a period of 5 years following the commencement of construction.

The annual report must describe the actions taken to inform the community about project impacts and identify that community concerns about project impacts have been taken into account when reaching decisions.

7.3 Health safety and community infrastructure

During the SIA consultation process and in submissions received on the EIS and AEIS, the community and stakeholders raised a number of concerns about health, safety and community infrastructure impacts associated with social and environmental practices arising from the project. EIS submitters identified that the following impacts required mitigation or management:

- monitoring dust, air quality, noise and blasting impacts on the health and lifestyle of the remaining Acland landholder, nearby landholders and residents
- impacts of the JRLF on Jondaryan residents in relation to dust, noise and air quality, and uncertainty about the timing of its decommissioning
- impacts on water resources and bores
- road closures, increased distances and travel time, including an increased response time for emergency services
- changes to the Acland township and the high level of impact on the remaining landholder
- future management of the Acland township, including the War Memorial, Tom Doherty Park and New Acland Colliery No. 2 heritage site
- increased demand for health services as a result of workforce expansion during construction and operations.

7.3.1 Management and mitigation measures

In response to community concerns about health, safety and community infrastructure impacts, the proponent has committed to a range of environmental management strategies that form an Adaptable Management Strategy for the project. This strategy includes rigorous and sophisticated monitoring of air quality, noise and blasting events, incorporates real-time monitoring and management, as well as public monthly reporting.

The proponent has also committed to conducting targeted consultation with nearby landholders and residents where modelling predicts the potential generation of dust, noise and vibration events, as well as investigating all community concerns promptly and to respond appropriately.

The Jondaryan township is a separate area of impact from the mine, given the close proximity of the JRLF. Jondaryan residents raised concerns regarding the impacts of

dust and noise on their community from the existing load out facility, and expressed uncertainty about when the JRLF will be decommissioned.

In response, the proponent will improve monitoring, regularly report results, and undertake specific consultation and engagement about the operation of the JRLF.

To provide certainty about when the JRLF will be decommissioned, I have conditioned that all coal transported by rail from start of the Stage 3 project must be distributed from the TLF on the mining lease.

Concerns about health impacts associated with changes to air quality, noise and blasting as a result of mining operations were considered by the proponent in the EIS and AEIS.

The proponent consulted with local and regional Queensland Health professionals to ascertain if data exists on the effect of existing mining activities in the local area on physical and mental health. The following conclusions were reached:

- there is no evidence of elevated respiratory illness for patients within a 10km radius of Acland and there have been no recent increases in respiratory illness in the area
- local health service providers have not seen any patients who attribute adverse health symptoms to noise, dust or other aspects of the proponent's operation and have not seen any patients whose symptoms they would attribute to the existing mine's operation
- health service providers did not identify any presentations by patients in relation to mental health issues related to the proponent.

In summary, there is no epidemiological evidence and no evidence from the experience of the hospital and general practice that would indicate health issues are being caused by the existing mining operation, or would be expected to result from the proposed project.

The proponent has committed to continue collaborating and consulting with the Darling Downs Hospital and Health Services about the monitoring of future health concerns and any impacts associated with mining operations.

Management of Acland township and Heritage site

The proponent's Acland Management Plan (AMP) and the Acland No. 2 Colliery Conservation Plan sets out the arrangements and commitments for the management and maintenance of the Acland Township on land owned or intended to be purchased by NAC. This includes Tom Doherty Park, which is where the Acland War Memorial is located.

In line with the proponent's intention to improve consultation and engagement, the proponent has committed to involving all relevant stakeholders and the broader community in the implementation and delivery of the AMP.

7.3.2 Coordinator-General's conclusions

The conditions I have set requiring specific reporting during the pre-construction, construction and operational phases of the project will encourage continuous improvement to the proponent's plans for collaboration and sharing of information with affected landholders and residents for the life of the project.

In response to concerns raised by the Jondaryan community regarding noise and dust impacts from the existing rail load out facility, I have set a condition that the new facility will be the sole distribution point for all railed product produced by the project from the day of first operations of stage 3.

7.4 Housing and accommodation

The EIS assessed that there will be a negligible impact on the local or regional housing market, as there will be a limited increase in the number of construction and operational workers who will reside temporarily or permanently in both the locality and the region.

There is no proposal by the project to use fly-in fly-out workers.

During the 26-month construction period there will be, on average, 136 workers. The number of workers will rise to 260 at peak construction. Following completion of construction, 135 additional operational workers will be required, increasing the total operational workforce to 435 at peak.

The proponent expects that the construction workforce will be made up of local resident workers, workers from the TRC area and from the broader South East Queensland region. The proponent is focused on recruiting resident local and regional workers where possible. It is anticipated that the number of construction workers seeking temporary housing will be limited and it is not expected that this will impact housing supply in the region.

In addition there is a small increase in the operational workforce numbers from the current level of 300 to 435, with demand spread across several years as ramp-up to full production occurs. It is anticipated that housing markets in Oakey, Jondaryan and surrounding townships, and regionally in Toowoomba, will collectively be able to absorb the limited number of new workers moving to the area. This population increase will not adversely affect the overall provision of temporary or permanent accommodation across the region.

7.4.1 Management and mitigation measures

The proponent has developed a Housing and Accommodation Action Plan that includes mitigation and management strategies to minimise any potential housing impacts. The plan includes:

- committing to source resident local workers during construction from the TRC area to minimise the demand for additional accommodation

- committing to maximise local employment, with a 70 per cent target for local workers to minimise the number of new operational workers moving into the area and to reduce demand on the local housing market
- committing to consult early with local temporary and short-stay accommodation providers to determine suitability and availability during peak construction periods for construction workers
- monitoring the availability and cost of rental housing in the Toowoomba region to ensure construction and operational worker housing demands do not impact on affordability
- continuing to liaise with local real estate agents about workforce numbers and the availability and suitability of accommodation for the construction and operational workforce
- Informing and encouraging operational workers to seek accommodation in areas with greater housing availability and market capacity, based on local knowledge and monitoring of the housing market.

7.4.2 Coordinator-General's conclusions

The likely impacts of additional construction and operational workers on the local and regional housing markets are expected to be minimal. In view of the overall number of workers accessing the market during each phase of the project, coupled with the commitment by the proponent to maximise local and regional employment strategies.

I recommend the proponent implement its Housing and Accommodation Action Plan for the project workforce during the construction and operational phases of the project to manage mitigate and minimise any potential housing impacts.

The conditions I have set requiring specific reporting during the pre-construction, construction and operational phases of the project will describe the proponent's actions, outcomes and adaptable management strategies to avoid, manage and mitigate project-related impacts on the local and regional housing market.

7.5 Regional business development and local content

The project is expected to generate a significant positive economic impact in the Toowoomba region, with a total expenditure of \$547 million during construction and \$2.7 billion during operations estimated to be expended in the regional study area.

7.5.1 Management and mitigation measures

The proponent has committed to develop and adopt the Queensland Resources and Energy Sector Code of Practice for Local Content 2013 (QRC Code) and associated implementation and reporting guidelines.

A Local Content Action Plan has been developed, which commits to a range of strategies to provide business opportunities for local, regional and Queensland-wide businesses. These include the following requirements:

- open and transparent procurement process
- ongoing liaison and communication with local suppliers and contractors, through local briefings, register of interest in the project and fact sheets
- increased capability for local suppliers to tender by providing pre-tender training and procurement information sessions
- informing suppliers of potential procurement opportunities in a transparent manner through the development of a procurement plan and implementation of the Local Content Action Plan's strategies.

7.5.2 Coordinator-General's conclusions

I require the proponent to be a signatory to the QRC Code and ensure that Queensland suppliers, contractors and manufacturers are given full, fair and reasonable opportunity to tender for project-related business activities.

Proponents adopting the QRC Code will submit an annual Code Industry Report to QRC demonstrating how the principles and framework of the code have been applied.

It is my expectation that the proponent's commitments, along with any other initiatives adopted as a result of ongoing engagement with local and regional businesses, will be reflected in these reports.

7.6 Workforce management

The SIA identified a range of positive workforce management opportunities including:

- direct employment opportunities through the creation of new positions
- indirect employment opportunities through increased demand for local and regional business services
- provision of education and training opportunities in both mining and agriculture.

The proponent is committed to recruiting workers from the local and regional areas as part of its workforce management strategy.

The proponent states that the workforce will be predominately drive-in/drive-out during construction. The proponent has set a target of recruitment of at least 70 per cent local workers who currently reside in the local and regional study area during the operational phase of the project. The proponent expects that the remaining 30 per cent would be recruited from the wider South East Queensland region.

7.6.1 Management and mitigation measures

The proponent has developed a Workforce Management Action Plan (WMAP) that commits to implementing specific strategies, initiatives and partnerships to respond to identified project impacts and support local and regional employment. WMAP includes the following commitments:

- equal employment opportunities through a targeted campaign to recruit a diverse workforce including Indigenous people, women, school leavers and the unemployed

- maximise local access to employment opportunities
- employment of unskilled, semi-skilled and skilled workers
- provision of structured training programs including apprenticeships and traineeships
- continued up-skilling and training of staff
- target of 20 per cent female staff.

To deliver on these commitments, the proponent will utilise existing partnerships and will work with education and training providers across private and government sectors, in order to develop and implement employment opportunities, training pathways, work experience and vocational employment initiatives.

These will be delivered by the proponent in collaboration with Downs Group Training, University of Southern Queensland, University of Queensland and Oakey State High School, traditional owners and the Oakey Reconciliation Committee.

In addition, the proponent has also committed to a range of employment strategies and programs to contribute to building and maintaining a diverse workforce. These initiatives include:

- distributing and circulating employment opportunities through interest groups community groups, local Indigenous communities and Oakey Reconciliation Council
- identifying a new advertising location to reach a diverse range of population groups
- undertaking recruitment and employment workshops in Oakey to encourage the local population to apply for workforce opportunities
- meeting with the Queensland Resources Council Women in Mining Group to better understand and overcome barriers to employing women in the mining sector
- investigating the potential partnership with the tertiary education sector to conduct a master research project at understanding barriers to employing diverse population groups in the mining sector.

7.6.2 Coordinator-General's conclusions

I require the proponent to:

- implement all new commitments to maximise local employment opportunities over the life of the project, including for Indigenous people and other diverse and disadvantaged groups
- provide training and development opportunities locally and regionally to support, maintain and develop a sustainable skilled workforce and to provide opportunities for people to improve skills and gain employment in the mining sector
- work in collaboration and partnership with identified stakeholders in the SIA to implement the identified workforce management strategies to ensure that appropriate outcomes are delivered and the strategies can be effectively monitored and reported.

These measures represent a satisfactory response to local and regional workforce issues.

The conditions I have set requiring specific reporting during the pre-construction, construction and operational phases of the project will document the proponent's actions, outcomes and adaptable management strategies to enhance local and regional employment, training and development opportunities.

8. Matters of national environmental significance

8.1 Background

As described in Section 3 of this report, the New Acland Coal Mine Stage 3 project (the project) has been assessed under the bilateral agreement between the Australian and the Queensland governments. This chapter presents my assessment on matters of national environmental significance (MNES).

8.1.1 Assessment requirements

On 20 April 2007, New Acland Coal Pty Ltd referred the project to the Commonwealth Environment Minister for a determination as to whether the project would constitute a controlled action with respect to potential impacts on MNES.

On 24 May 2007, the Australian Government determined the project to be a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (reference number: EPBC 2007/3423). The decision was made due to the likelihood of significant impacts on listed threatened species and communities (sections 18 and 18A of the EPBC Act).

On 11 December 2008, the Australian Government Department responsible for administering the EPBC Act, now known as the Department of the Environment (DE) accepted a variation request to the proposed project, which involved additional extraction of coal (from up to 9 million tonnes per annum (Mtpa) to up to 10Mtpa), creation of a rail spur and loop, and staged increase in production.

On 9 November 2012, DE accepted a further variation to the proposal, which reflected a reduction to the project's scope. This variation noted a reduction of the disturbance footprint by 2,304ha, establishment of a buffer zone around the town of Acland, acknowledgement that Lagoon Creek would no longer be diverted, and a reduction of maximum coal production from 10Mtpa down to 7.5Mtpa.

On 17 October 2013, the Commonwealth Minister for the Environment confirmed the newly created controlling provision, a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E of the EPBC Act) would also apply to the project.

The bilateral agreement between the Queensland and Australian governments, which applies to the evaluation of this project, sets out the requirements for the purposes of

the Australian Government's assessment under Part 8 of the EPBC Act. These requirements are incorporated by the State into a project's EIS assessment process.

After a copy of this report is provided to the Australian Government, a decision on the controlled action under section 133 of the EPBC Act will be made by the Commonwealth Minister for the Environment. The minister will use the information in this report to decide whether the project should proceed, and if so, if any additional conditions, beyond those I have recommended in this report, will be applied to limit or manage the impacts on MNES.

8.1.2 Description of the proposed action

New Acland Coal Pty Ltd, a subsidiary of New Hope Corporation Limited, proposes to develop the New Acland Coal Mine Stage 3 project (the project), located around 160 kilometres (km) west of Brisbane, 35km north-west of Toowoomba, and 10km north-west of Oakey.

New Acland Coal Pty Ltd currently operates the existing New Acland coal mine, an open-cut, thermal coal operation able to produce up to 5.2Mtpa of product.

The project proposes to expand the existing open-cut operation to up to 7.5Mtpa product coal, which would equate to around 15Mtpa of run-of-mine (ROM) coal each year. The project proposes three open-cut pits located in two new resource areas within mining lease application (MLA) 50232, being the Manning Vale and Willeroo resource areas. This would extend the current mine's operation up to the year 2029, or a 12 year period.

On 4 August 2014, the proponent confirmed with the state government that 1,401ha of MLA 50232 had been abandoned from the mining lease application, reducing the lease area from 5,069ha to 3,668ha.

The project's disturbance footprint will total around 1,466ha. Within this, the three open-cut areas will equate to around 1,201ha. The final voids will total around 457ha, have depths ranging between 60–80m and be profiled with benches and undulating slopes ranging from 8 to 19 degrees.

Around 145ha of vegetation from nine regional ecosystems (REs) will be cleared as a result of the project. In addition, around 65ha of ecological communities listed as threatened under the EPBC Act will be affected.

Associated mine infrastructure for the project includes existing infrastructure, upgrades to current facilities, and new infrastructure to be located on the existing ML 50170 and ML 50216. The project's rail corridor will be located on mining lease (Infrastructure) 700001.

The mine's existing JRLF, located around 1km from the town of Jondaryan, will be decommissioned.

The rail spur line will extend around 8km from Jondaryan to the southern portion of the mining lease. A rail loop, materials handling facility (MHF) and train load-out facility (TLF) will be constructed on the MLA.

Section 2 of this report provides further information on the key project components. A full project description is contained in the project's EIS and AEIS.

8.1.3 Relationship with other developments

The proponent commissioned construction of an approximately 45-kilometre-long water pipeline from Toowoomba Regional Council's Wetalla Wastewater Reclamation Facility. The pipeline supplies Class A+ water for the existing mine's use, and will continue to supply the project.

The pipeline was evaluated by the Coordinator-General in late 2008, and constructed in 2009. The mine has a 43-year contract in place with the council to supply up to 5,500ML per year.

Periodically, the proponent also sources a small amount of brine from the Oakey reverse osmosis water treatment plant, located approximately 10km south of the project site.

In terms of product distribution, while up to 200,000 tonnes per annum of coal will be trucked to domestic customers by third-party transport contractors, the majority will be transported on the West Moreton rail system that travels to the Port of Brisbane. The proponent has a rail distribution agreement with Aurizon Limited.

Queensland Bulk Handling Pty Ltd, a subsidiary of the proponent's parent organisation, operates a 10Mtpa capacity coal loading, common-user facility at the port.

In terms of mining operations in the vicinity of the project, the nearest coal mine is Meandu Coal mine, which supplies the Tarong Power Station. Meandu mine is located 50km north-east of the project.

The Wilkie Creek mine and Kogan Creek mine are located 72km and 91km north-west of the project respectively. Both mines use the West Moreton rail system to transport product. However, at the time of writing, the Wilkie Creek mine was not operational.

8.2 Listed threatened species and ecological communities

8.2.1 Site context

The majority of the project site has been subject to long-term vegetation clearing to enable grazing and cropping. There is a high degree of habitat fragmentation and isolation, and weeds and vertebrate pests are evident. However, some remnants of original vegetation remain, particularly in riparian areas and near farm houses.

The project site is bisected by the ephemeral Lagoon Creek, which will not be diverted by mining activities.

The following discussion provides information on the MNES that will be affected by the project, and the mitigation measures and offsets that are proposed to be applied to manage and account for impacts.

8.2.2 Threatened species and communities not addressed as MNES

Flora

Two plant species that were listed as 'threatened' under the EPBC Act when the project was declared a controlled action are now no longer classified. The species are finger panic grass (*Digitaria porrecta*), and lobed bluegrass (*Bothriochloa biloba*). De-listing of the species occurred on 14 December 2013. As these species are no longer listed as threatened, they will not be considered within this MNES assessment.

Fauna

A number of submissions made on the EIS and AEIS raised interest about impacts of the project on koalas (*Phascolarctos cinereus*) and the species' suitable habitat.

The koala was listed by the Commonwealth as a threatened species in 2012, after the project was deemed to be a controlled action in 2007. This species is therefore not subject to assessment for the purposes of MNES for this project.

As the koala is considered a species of special least significance by the Queensland State Government, project effects on this species have been assessed in Section 5.6 of this report (Ecology).

Threatened ecological community

The EPBC Act Protected Matters Report included in Appendix G of the EIS lists the threatened ecological community (TEC) Coolibah—Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions as potentially occurring at the site. This species was listed in 2011.

As the report search included in the EIS was dated 2013, this species was included in the list; however as it was not listed at the time of the project's declaration as a controlled action in 2007, it has not been included in surveys and does not need to be assessed.

8.2.3 Assessment methodology

Survey effort

The EIS (2014) confirms that during 2000–13 a range of desktop assessments and field surveys were undertaken to investigate the site's ecology.

Flora and fauna investigations undertaken from 2000 to 2005 informed assessments required for the mine's current operation (stage 2). Information obtained during the stage 2 site surveys was used to inform studies that occurred from 2007 to 2013 to understand the ecological values and impacts related to the stage 3 project.

Information sources such as the EPBC Act Protected Matters Search Report; the EPBC Act Species Profile and Threats database (DE, 2013); Regional Ecosystem Mapping (Queensland Herbarium); the Queensland State Government Wildlife Online

database were searched to compile a list of threatened species and suitable habitat that may be present on site.

Survey efforts were then scoped to target searches for threatened flora species listed under the NC Act and the EPBC Act, threatened REs listed under the State's VM Act and threatened ecological communities (TEC) listed under the EPBC Act.

In the absence of EPBC-specific general survey guidelines for TEC and flora, the project's survey methodologies were informed by advice including Cropper, S.C. (1993) *Management of Endangered Plants* (CSIRO Publications, Melbourne, Australia) and vegetation survey methods published by the State Government Department of Environment and Heritage Protection (DEHP).

On-site searches for endangered, vulnerable and rare (EVR) flora species were undertaken using a general traverse, 'random meander' method. Flora and vegetation surveys were undertaken in 2005 and 2007 for stage 2, and for the current project, five times between 2007 and 2013. Table 8.1 provides an overview of these surveys.

Flora surveys that occurred in February to March 2007 concentrated primarily on the site's remaining remnant treed areas, native grasslands and road easements, with the purpose of understanding the species type, floristics, structure and condition of areas. The absence or presence of weeds and pests, and evidence of modification was also investigated. Plots and transect areas were delineated across patches of vegetation to map species diversity and structure, with site data recorded for each quadrant. A global positioning system (GPS) was used to record locations of threatened flora.

For TECs, condition surveys were undertaken over different periods both pre and post-drought, during 2007, 2011 and 2013 to verify the state of located communities. These surveys informed the development of mitigation measures and, where the proponent deemed impacts to be unavoidable, to calculate proposed offsets.

Methods such as those contained in the following publications informed survey approaches for the condition surveys:

- BioCondition: A Terrestrial Vegetation Condition Assessment Tool for Biodiversity in Queensland (Eyre et al) (2008) Environment Protection Agency Queensland;
- Method for the Establishment and Survey of Reference Sites for BioCondition (Eyre et al 2011) Department of Environment and Resource Management, Queensland
- Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner, V.J., et al) Queensland Herbarium (2012).

TEC listing advices, published online by the Commonwealth, were also used to inform survey efforts.

Table 8.1 summarises flora and vegetation surveys that occurred on-site where MNES species were considered.

Table 8.1 Flora and vegetation surveys relevant to MNES

Survey date	Survey scope: flora and vegetation
August 2005	General flora and vegetation survey—record species and vegetation communities (undertaken for stage 2 of the mine)
February 2007	Vegetation condition assessment of bluegrass Threatened Ecological Community (undertaken for stage 2 of the mine)
February – March 2007	Flora and vegetation survey—detailed surveys
20 November 2008	Traverse of the haul road route (in the vicinity of the now-proposed rail)
February 2011	Vegetation condition assessment of vegetation communities in impact area and offset sites
June 2013	Vegetation condition assessment of vegetation communities in impact area and offset sites
August 2013	Confirmation of REs, threatened species survey

While not indicated in the list above, opportunistic surveys for flora species were also included in the scope of field surveys for fauna that occurred during October and November 2013.

Figure 8.1 shows the locations targeted for on-site flora surveys.

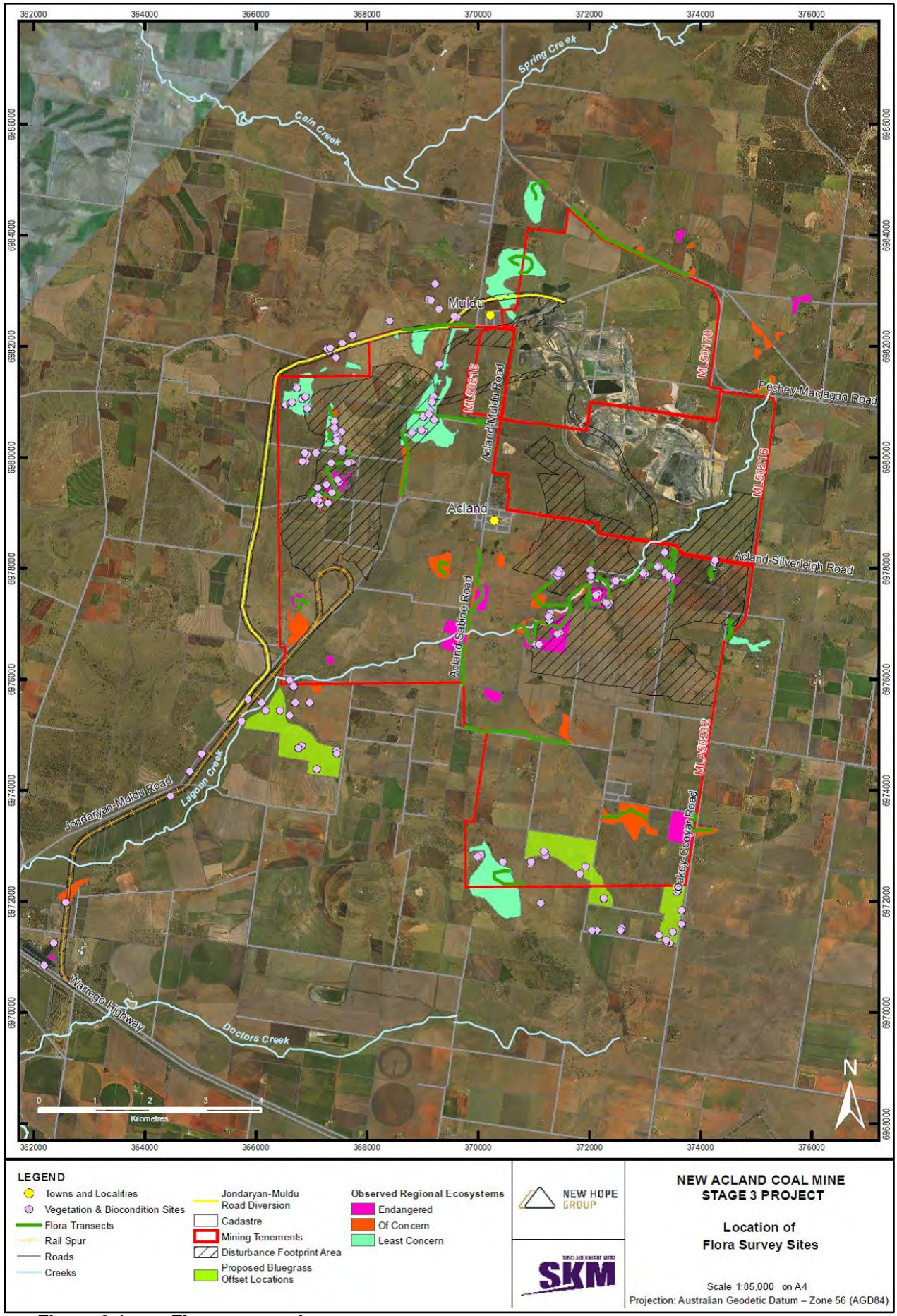


Figure 8.1 Flora survey sites

Fauna

On-site fauna surveys for stage 2 were undertaken in 1998, 1999, and 2007. For the stage 3 project, fauna surveys occurred from 26 February to 2 March 2007 (late summer-early spring) and 20 November 2008 (late spring), and during October-November 2013 (mid-late spring).

Primary locations for survey efforts were those that represented suitable habitat for threatened species, such as vegetated and riparian areas, farm dams and road sidings.

Survey techniques for reptiles included use of Elliott traps, pitfall traps, spotlighting, camera traps, searches for scats and tracks, and ground searches including in leaf litter, under and around stones and fallen timber.

Surveys for frogs and other amphibians included ground searches, spotlighting and dip netting.

For birds, surveys included morning and dusk counts and observations, call playback and spotlighting for nocturnal birds, camera traps, call identification, flushing and inspection of areas that included flowering nectar plants and searches for nests.

Bird surveys included targeted surveys for threatened species such as the Australian painted snipe, black-breasted button quail, red goshawk and the regent honeyeater.

For bats, Anabat II ultrasonic call recording was used. Active and passive detection was used, being that either an attendant recorded bat sounds in the field, or a detector was left in place to record continuously for a period of time. Where possible, calls were identified to the genus or species level using frequency analysis software. Spotlighting and harp traps were also used to understand the presence of bats.

Searches for ground-dwelling mammals included habitat searches, looking in tree hollows, logs, burrows (including with use of an endoscope for inaccessible areas), abandoned buildings and in dense vegetation. Methods such as Elliott and pitfall traps, spotlighting, camera traps, and searches for, and investigation of, scats and tracks were also used.

Incidental sightings that occurred during both flora and fauna survey events were also recorded.

Figure 8.2 shows the location of fauna survey sites.

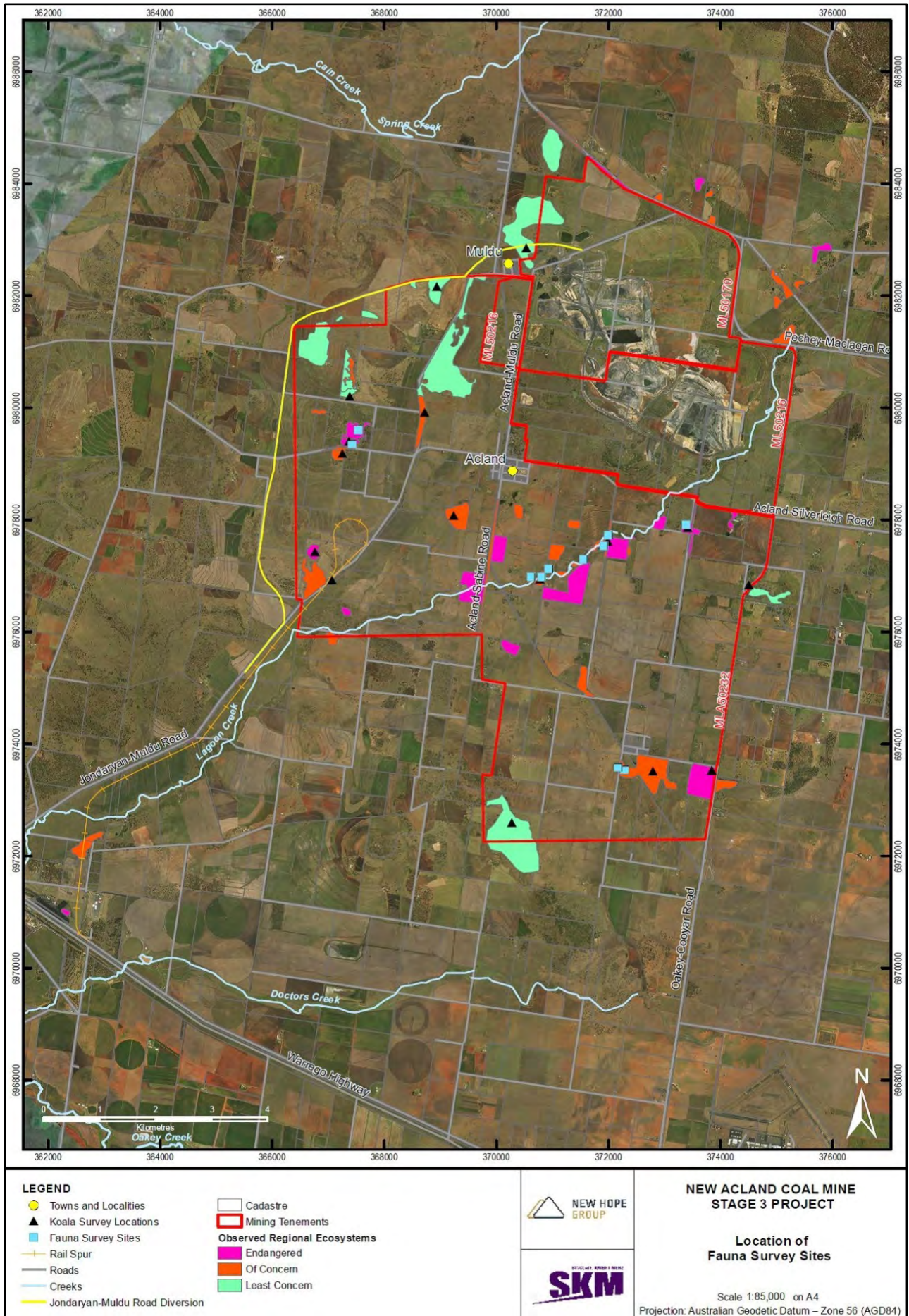


Figure 8.2 Fauna survey sites

I am satisfied with the survey effort that occurred over a number of years and seasons. The survey effort was iteratively informed by advice provided by EHP and DE on required approaches to verify ecological values at the site and suitable mitigation and offsets approaches, and was sufficient to understand the project's likely effects on MNES flora, fauna and ecological communities.

8.2.4 Threatened ecological communities and threatened species

Four EPBC Act listed TECs and 33 EPBC Act listed threatened species as potentially occurring in the action area based on the desktop assessment, which included DE's protected matters search tool. Of these, the following TECs and threatened species were found to occur during flora and fauna surveys conducted on-site:

- TECs:
 - Bluegrass (*Dichanthium spp.*) dominant grasslands of the Brigalow Belt Bioregions (North and South)—endangered
 - Brigalow (*Acacia harpophylla* dominant and co-dominant)—endangered
 - semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions—endangered
- Species:
 - *Homopholis belsonii*, Belson's panic—Vulnerable
 - *Pteropus poliocephalus*, grey-headed flying fox—Vulnerable

The following species, while not located during field surveys, were regarded as possibly occurring due to the presence of suitable habitat:

- *Dichanthium queenslandicum*, king blue-grass—endangered
- *Rhaponticum australe*, austral cornflower, native thistle
- *Picris evae*, Hawkweed—vulnerable
- *Thesium austral*, austral toadflax, toadflax—vulnerable

The following TEC and species, identified as possibly being present, were not located on site during field surveys and suitable habitat is not present.

- TEC:
 - white box-yellow box-Blakely's red gum grassy woodland and derived native grassland—critically endangered
- Species:
 - *Lathamus discolor*, swift parrot—endangered
 - *Neochmia ruficauda ruficauda*, star finch (eastern), star finch (southern)—endangered
 - *Poephila cincta cincta*, black-throated finch (southern)—endangered
 - *Xanthomyza Phrygia*, regent honeyeater—endangered
 - *Erythrorchis radiatus*, red goshawk—vulnerable
 - *Geophaps scripta scripta*, squatter pigeon—vulnerable

- *Rostratula australis*/*Rostratula benghalensis (sensu lato)*, Australian painted snipe/painted snipe—vulnerable
- *Turnix melanogaster*, black-breasted button-quail—vulnerable
- *Maccullochella peelii*, Murray cod—vulnerable
- *Dasyurus hallucatus*, northern quoll—endangered
- *Chalinolobus dwyeri*, large-eared pied bat, large pied bat—vulnerable
- *Nyctophilus corbeni*, south-eastern long-eared bat—vulnerable
- *Petrogale penicillata*, brush-tailed rock-wallaby—vulnerable
- *Potorous tridactylus tridactylus*, long-nosed potoroo (SE mainland)—vulnerable
- *Tympanocryptis pinguicolla*, grassland earless dragon—endangered
- *Anomalopus mackayi*, five-clawed worm-skink, long-legged wormskink—vulnerable
- *Delma torquata*, collared delma—vulnerable
- *Egernia rugosa*, yakka skink—vulnerable
- *Furina dunmalli*, Dunmall's snake—vulnerable
- *Paradelma orientalis*, Brigalow scaly-foot—vulnerable
- *Lepidium peregrinum*, wandering pepper-cress—endangered
- *Streblus pendulinus*, Siah's backbone, isaac wood—endangered
- *Cadellia pentastylis*, ooline—vulnerable
- *Clematis fawcettii*, stream clematis—vulnerable
- *Haloragis exalata subsp. Velutina*, tall velvet sea-berry—vulnerable
- *Picris evae*, hawkweed—vulnerable
- *Sarcochilus weinthalii*, blotched sarcochilus, weinthals sarcanth—vulnerable
- *Thesium austral*, austral toadflax, toadflax—vulnerable

8.2.5 Confirmed MNES species

Five threatened species and communities were found during site surveys. The MNES found were three TECs; one flora and one fauna species. Table 8.2 lists the species confirmed on site during surveys.

Table 8.2 Confirmed MNES species

Type	Name	Status
Listed TECs		
TEC (3)	Bluegrass (<i>Dichanthium spp.</i>) dominant grasslands of the Brigalow Belt Bioregions (North and South)	Endangered
	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered
	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered
Listed threatened species: flora		
	<i>Homopholis belsonii</i> , Belson's panic	Vulnerable
Listed threatened species: fauna		
	<i>Pteropus poliocephalus</i> , grey-headed flying-fox	Vulnerable

Figure 8.3 shows the locations across the project site where threatened flora and state-listed REs were located. Figure 8.4 shows the locations across the project site where MNES TECs and threatened species were located.

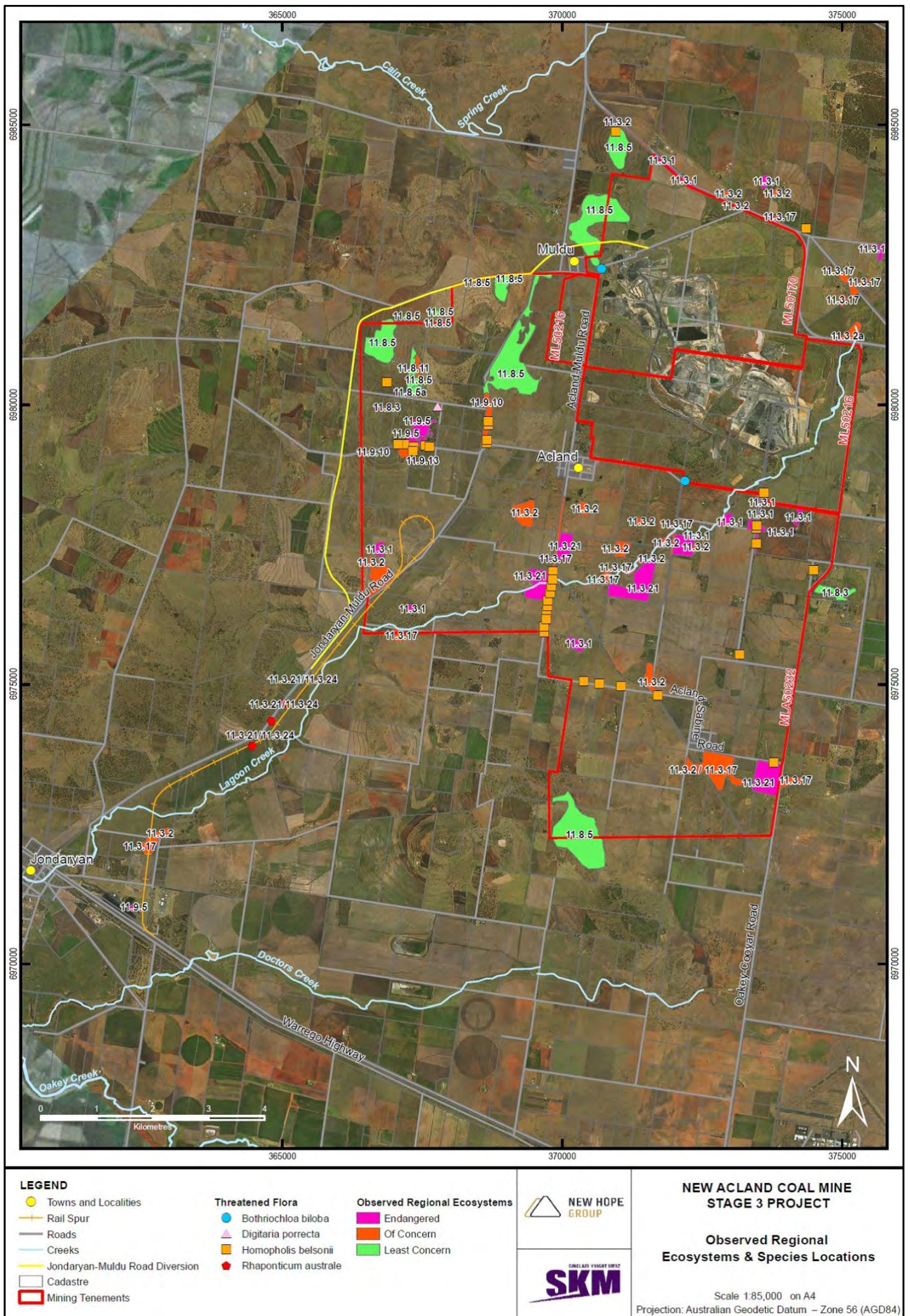


Figure 8.3 Observed REs and threatened flora locations

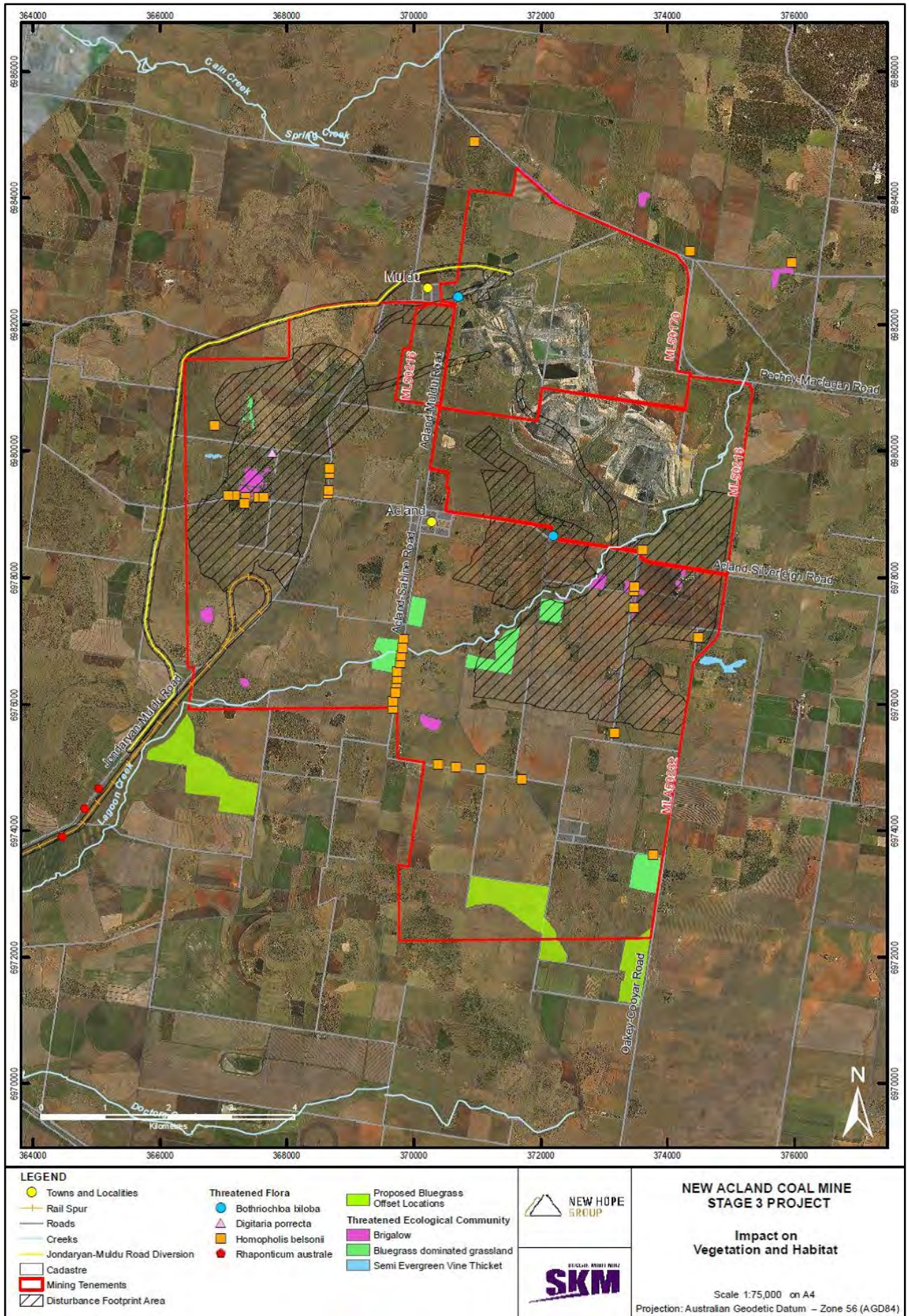


Figure 8.4 Threatened ecological communities and species locations

For the confirmed MNES located at the site, I recommend a condition of approval to the Commonwealth Minister for the Environment (Appendix 3) that the proponent develop and submit an MNES Management Plan (MMP) prior to commencement of construction.

The MMP is to address, for each species and ecological community, appropriate management and mitigation measures to protect and enhance the values of MNES. The MMP is recommended to consider management of MNES on site that will not be impacted by project works; species found during pre-clearing surveys; and offset areas for species and TECs that require offsetting.

The MMP will be underpinned by species-specific management plans as recommended in this report and as decided by the Minister for the Environment.

The MMP is also required to address species that may be found on site during project works, and specify how impacts are to be avoided to ensure no net loss. Included in this is the recommendation that the MMP require pre-clearance surveys for MNES in all project areas, including roadworks and powerlines.

The following section discusses each of the MNES confirmed at the project site.

Bluegrass dominant grasslands of the Brigalow Belt Bioregions (North and South)

EPBC Act listing status: endangered

TEC listing: background

In December 2008, the Bluegrass (*Dichanthium spp.*) dominant grasslands of the Brigalow Belt bioregions (north and south) (BDG) TEC was revised by the Commonwealth government to form two new TECs, being the:

- Natural grasslands of the Queensland Central Highlands and northern Fitzroy Basin (listed as Endangered); and
- Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland (listed as Critically Endangered).

For the purposes of evaluating the project's impacts on threatened species and communities, as the TEC was decided in 2007 to be a controlled action relating to the project, the Commonwealth department now known as DE confirmed the historical criteria for the BDG will be considered in determining offsets required to account for impacts on the community.

Description

Bluegrass (*Dichanthium spp.*) is an upright, perennial grass usually between 30–80 centimetres (cm) in height. It appears in tufts that are generally only around 10–15cm in diameter. Its leaves are flat, 8–15cm long and 2–4 millimetres (mm) wide. It is typically blue-purple in colour.

Distribution

Grasslands dominated by *Dichanthium spp.* occur over a broad geographic range in Queensland including the Brigalow Belt (North and South), the Desert Uplands and the Gulf Plains. Species composition of these grasslands is strongly influenced by soil type. Bluegrass grasslands occur on heavy clay soils that can range from grey to black in colour but are generally referred to as 'black soils' (Blake 1938).

The recommendation to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee on a public nomination for an ecological community listing on the EPBC Act noted that the TEC's geographic distribution had decreased to around 10 per cent (116,130ha) of its former range.

EPBC Act survey requirements/techniques

There are no specific guidelines for survey requirements for the TEC. Surveys of sites and offset areas were informed by the TEC listing advice and the following publications:

- Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner et al., 2012)
- Biocondition methodology for treeless ecosystems (Department of Environment and Resource Management 2011).

Survey effort and observations

Table 8.1 details the survey dates and scope of surveys undertaken from 2005 to 2013. Section 1.2.3 of this report (Assessment methodology) confirms the TEC and flora survey approach. Appendix G.5.4 provides vegetation survey data sheets from secondary, tertiary and biocondition surveys undertaken in June and August 2013.

Patches of BDG within the project site were assessed in early 2007 in the New Acland Stage 3—Baseline Environmental Study (SKM 2007). They were reassessed on 9 and 10 February 2011 following above-average summer rains; and again in August 2013 (late winter and early spring). For the 2011 survey, BDG patches were investigated to understand floristics, density and condition.

In August 2013, to inform the EIS analysis, affected BDG patches and proposed offset sites were surveyed. Both the condition of affected vegetation, and that at the proposed offsets sites, were inspected.

The 2013 surveys confirmed the amount of BDG had decreased since the 2007 surveys. Some areas now feature woody vegetation regrowth occurring throughout the community. The regrowth is consistent in height (around 2m) and age, and is of a density that dominates the location, shading the understorey grasses.

Of these grasses, *Dichanthium sericeum* dominated, while other grasses, herbs and forbs that may be found in BDG were not present.

The EIS found that this change is usual in an area that was previously vegetated but has been cleared for pasture, following which grazing pressures have been removed;

resulting in woody vegetation re-establishing. The reduction reflects the community moving from a grassland community to regenerating Brigalow and Poplar Box areas.

No listed fauna and only one listed flora species that is usually associated with the community was located during surveys, being 12 patches of *Homopholis belsonii* (Belson's panic).

The BDG community located within the Willaroo pit impact area was found to be of low quality, with low diversity of grassland species, dominance of *Dichanthium sericeum* and a moderate level of weed infestation.

The quality of the community in the Manning Vale West pit impact area was found to be of higher quality, with a greater diversity of grassland species.

Occurrence within project area

Five separate patches of BDG were confirmed on site, with an additional one occurring in the now abandoned section of MLA50232. No mining will occur in this latter area. Two patches are located in proximity on opposite sides of Acland Sabine Road. Figure 8.4 indicates the location of the communities.

Impacts of the proposed action

Impacts associated with the proposed project activities include loss of patches of the TEC due to land clearance associated with construction and operation activities over a 13-year period.

Possible impacts include:

- over-grazing, trampling from APC activities
- indirect effects including pest and weed invasion, bushfire management, altered hydrogeological conditions, dust, noise, edge effects, artificial lighting, altered final landform, water quality and availability, waste and contamination.

Residual impact

In total, a residual impact on 40.1ha of BDG ecological community is estimated. Figure 8.4 shows the impacted BDG areas.

Of the five areas of BDG found on the project site, three BDG locations will be impacted. Of two stands to the east of the MLA, 35.89ha will be impacted by the Manning Vale East pit, with 7.15ha remaining on the edge of the pit. One BDG patch equating to 4.2ha will be impacted by the footprint of the Manning Vale West mine pit.

The two patches adjacent to Acland Sabine Road will not be directly affected by project works.

The total impact consists of 4.2ha of RE 11.8.11 (*Dichanthium sericeum* grassland on Cainozoic igneous rocks) and 35.9ha of non-remnant (that is, species that has been cleared and has re-established) RE 11.3.21 (*Dichanthium sericeum* and/or *Astrebla* spp. grassland on alluvial plains: cracking clay soils).

RE 11.8.11 is listed under the Queensland VM Act as endangered; with RE 11.3.21 listed as of concern.

The impact equates to a significant impact as per the *Commonwealth Significant Impact Guidelines 1.1* (2013) due to considerations including the possibility of the action interfering substantially with the recovery of the species and reducing the area of an important population.

Recovery plans, conservation advices and threat abatement plans

Conservation Advice: A conservation advice has not been prepared.

Recovery Plan: There is no recovery plan for BDG.

Draft recovery plan: Butler DW (2007). Draft Recovery plan for the “Bluegrass (*Dichanthium* spp.) dominant grasslands of the Brigalow Belt Bioregions (north and south)” endangered ecological community, 2007-2011 (unpublished).

There is no threat abatement plan in place for BDG.

Threat reduction/control

The draft recovery plan identified the following as key threats to the TEC:

- expansion of exotic pastures and tree crops
- expansion of mining activities
- expansion of cropping cultivation
- persistent heavy grazing. While used as fodder, BDG is vulnerable to over-grazing. The species' weak root system leaves it prone to being dislodged if disturbed during drier periods
- invasive species
- construction of roads and other infrastructure
- knowledge gaps.

The draft recovery plan for the TEC recommended the following recovery actions:

- promote landholder awareness of sustainable management of bluegrass grasslands
- encouraging landholders to enter into conservation agreements over bluegrass areas
- conduct research into use of bluegrass grassland species in pasture renovation and land rehabilitation activities
- assist graziers to fence bluegrass grasslands out from other land types and to subdivide bluegrass grasslands to facilitate sound grazing management, including rest from grazing during critical periods in the summer growing season
- increase the area of bluegrass grassland in the conservation estate
- conduct research into the basic ecology of key threatened species.

Avoidance and mitigation measures

The proponent has committed to mitigation measures that seek to protect and enhance the ecological values at the project site. Such measures apply directly and indirectly to reducing impacts on MNES. These include:

- All remnant vegetation that does not require clearing will be protected from further disturbance (commitment 198).
- All vegetation clearance will be restricted to that necessary for the safe operation of mining activities (commitment 497).
- Lagoon Creek will not be diverted, minimising hydrogeological changes on site.
- A nature conservation zone of 50 metres either side of Lagoon Creek will be implemented, with mining excluded within 150 metres. The riparian values in the conservation zone will be enhanced (commitments 118, 120, 185, 190, 209 Appendix D, AEIS).
This has been conditioned as a requirement at Appendix 1.
- Areas to be cleared will have boundaries clearly marked. The demarcated boundaries will conform within the limits of design drawings and will comply with the mine's existing clearance procedures. Particular attention will be paid to defining the boundaries of clearing where MNES endangered ecological communities or listed species are present (commitment 496).
- Implementing the Pest and Weed Management Plan and the Pest and Domestic Animal Management Plan (commitment 212).
- Final landforms, including voids, to be located outside of the probable maximum flood (PMF) area.
- Surface water management measures including flood levees, diversion drains, sediment control structures, storage dams have been conditioned to avoid and minimise environmental harm (Appendix 2).
- Contour banks will be constructed after profiling of the final landform to control run off, minimising hydrological disturbance.
- Extensive dust control measures conditioned at Appendix 2.
- Bushfire prevention and management measures; fire management plan.
- Machinery brought on to site will be required to be weed-free. Advice will be sought on local weeds from the State Department of Agriculture, Fisheries and Forestry (DAFF) (commitment 565) and Toowoomba Regional Council.
- Delivery of an Erosion and Sediment Management Plan (commitment 232).
- The EM Plan (AEIS) states light sources will be fitted with shielding devices to reduce and remove light pollution. Where possible, lighting required for the project site will be oriented inwards, focusing on areas requiring illumination and screened from the outside.
- Extensive dust mitigation and management strategies, as conditioned by me, are discussed in Section 5.3 of this report.
- Continued use of existing mine structures (CHPP; MIA; MHF) to avoid new land disturbance.
- In-pit tailings disposal and management to avoid new structures and additional land disturbance.
- Conditioned requirement to not pollute ground and surface water resources.

- Waste management plan to avoid contamination and ineffective disposal and handling of toxicants.
- Hazard and risk management plan.
- The recommended condition requiring pre-clearing surveys for listed species.
- Vegetation clearing to be during the day and one-directional, to allow fauna to escape.

To the extent that impacts can be mitigated, I consider the measures proposed for the protection of BDG along with the my recommended conditions will be sufficient. However, as mitigation alone is not sufficient to reduce the likely residual impact to BDG, an offset is required.

Offsets

I have determined that the 40.1ha of BDG to be cleared will constitute a significant residual impact and requires offsetting. The proponent has calculated the offsets requirement in consideration of the EPBC Act Environmental Offsets Policy (2012) and supporting documents.

Historical condition thresholds as specified in the original BDG listing have been used to inform the amount of offsets the proponent is required to provide.

When taking into account required considerations such as condition of the vegetation; site context (including connectivity); and species stocking rate, the proponent has assessed the quality of impacted BDG areas to average five out of a possible score of 10.

Three *Dichanthium sericeum*-dominated grassland offset areas are proposed to be located on land owned by the proponent's associated Acland Pastoral Company (APC) south of the mine. Surveys have confirmed that an area of 247ha is suitable for use as a BDG offset.

Of this area, 90ha will constitute BDG communities as a direct, land-based offset to account for the project's residual impact on 40.1ha of BDG. This offset has been calculated based on a 100 per cent direct contribution, therefore the bluegrass offset strategy proposes no indirect offsets.

The proponent confirms the offset sites will be protected and secured using a legally binding mechanism on the land title, such as a covenant that may be made under the *Land Title Act 1994* or *Land Act 1994*, or gazettal as a protected area (for example, a nature refuge) under the NC Act. Commitment 523 (AEIS, Appendix D) refers.

Bluegrass Offset Management Plan

A Bluegrass Offset Management Plan (BOMP) has been developed by the proponent as a component of the OAMP. The BOMP confirms the direct offset commitment and describes how the *Dichanthium sericeum* dominated grassland communities are proposed to be managed, monitored and maintained.

The BOMP states surveys have found that the three offset sites have existing bluegrass ecological communities and *Dichanthium sericeum* regeneration potential.

The sites are located adjacent to a State significant biodiversity area as mapped by the State Government's Biodiversity Planning Assessment.

The offset sites were surveyed to determine their condition as compared to historical condition thresholds for the listing advice for the BDG. The surveys also included considerations such as if the sites featured specified REs.

The results of the surveys were used to categorise zones within the sites into three key management areas, being:

- translocation areas
- assisted natural regeneration areas
- bluegrass rehabilitation areas.

A specialised management plan will be developed for each type of site, with the overall objective for each being to improve the site's condition to the values of a bluegrass ecological community. The stated aim in the EOS is that the offsets be restored to a future quality classification (as defined by instruments supporting the Commonwealth Environmental Offsets Policy (2012)) of 8 out of 10.

For the translocation sites, while focusing on translocation of lobed blue-grass, Belson's panic and finger panic grass, translocation of herb and forb species associated with the bluegrass TEC will also be undertaken.

Assisted natural regeneration areas are those that were found to have significant areas of bare earth, ranging from 30 to 45 per cent, and had been subject to continuous grazing or had historically been cropped. These areas contained up to three of the bluegrass RE indicator species. Weed management will be a particular focus of these sites.

Bluegrass rehabilitation areas contain non-native species that will be reduced through measures recommended in the Commonwealth draft recovery plan, including heavy cattle grazing, ploughing, and if necessary, herbicide that will reduce non-grass species.

Planting in the offset areas will prioritise use of seeds harvested from BDG communities, with a preference for the use of local seeds.

Each site's action plan will address and document requirements for weed control, spelling, site preparation for planting, monitoring and ongoing management. Monitoring and condition evaluation will be included in the plans.

The APC will be responsible for management of the offset site areas. When the areas satisfy the criteria to be regarded as BDG ecological communities, the proponent proposes the areas will be used for sustainable grazing, again managed by APC.

The BOMP (Section 4, Appendix J.8, EIS) includes possible management actions developed in line with the BDG's draft recovery plan that may be undertaken.

The actions include measures such as promoting landholder awareness of sustainable management of bluegrass grasslands; encouraging landholders to enter into

conservation agreements over bluegrass areas; and conducting research into use of bluegrass grassland species in pasture renovation and land rehabilitation activities.

Coordinator-General's conclusion—bluegrass

To account for the 40.1ha of BDG that will be impacted by mining, the proponent has proposed direct offsets in the vicinity of the mine site equating to 90ha. I am satisfied that this proposal, should it be found the offset areas can be improved and are self-sustaining, sufficiently addresses the project's impacts on this TEC.

The targeted measures proposed for improving the ecological values of land owned by the proponent, a proportion of which has deteriorated environmental values due to past clearing and the presence of weeds and pests, are supported.

The rehabilitation and ongoing maintenance of land as described in the BOMP supports the target of no net loss of a threatened grassland ecological community.

The bluegrass offsets program of works will provide an opportunity to improve knowledge about natural grassland ecological restoration and management.

My recommended conditions of approval to the Commonwealth Environment Minister (Appendix 3) for the BDG TEC include:

- a maximum disturbance limit of 40.1ha to limit impacts on BDG.
- the BDG TEC is to be included in the MMP (Appendix 3). The MMP should consider how BDG present on project areas outside of the project footprint will be protected and enhanced. Relevant threat abatement plans and advice from the draft recovery plan are to be considered in strategies included in the MMP for this species.
- the MMP is to cite various mechanisms, such as the BOMP, that will account for management of impacted BDG.
- the proponent provide offsets for authorised unavoidable impacts to 40.1ha of BDG in accordance with the EPBC Act Environmental Offsets policy (October 2012).

I have also recommended a further condition requiring the proponent to include offsets provision and management strategies for the BDG TEC in the project's OAMP. I am satisfied the proposed action will not have an unacceptable impact on the BDG TEC should the relevant mitigation measures, offsets requirements and environmental conditions be met.

Brigalow (*Acacia harpophylla* dominant and co-dominant)

EPBC Act listing status: endangered

Description

The TEC is a woodland system, characterised by its tall slender *Acacia harpophylla* brigalow acacias as the generally dominant or co-dominant species. Co-dominants include other acacia species, eucalypts, and *Casuarina cristata* (belah). In some instances, these species may be more common than brigalow. A shrub layer is usually present in the ecological community.

Ranging from open forest to open woodland, the tree layer height ranges from around 9–25m, depending on rainfall availability. Brigalow and belah are tolerant of saline conditions. Brigalow is highly tolerant of dry conditions.

Associated fauna species such as reptiles rely on litter and woody debris. Bats and mammals rely on bark pockets and tree hollows. Food from the TEC attractive to birds includes belah seeds.

Distribution

The TEC extends from south of Townsville in Queensland to northern New South Wales. In Queensland, the ecological community largely occurs within the Brigalow Belt North, Brigalow Belt South and Southeast Queensland bioregions.

As described by the Commonwealth listing advice, the Brigalow TEC has significantly declined following broadscale clearing in Queensland and New South Wales for agriculture. Nationally, the TEC has declined to around 10 per cent of its former presence, with remaining remnants tending to be found as fragments on the edges of modified areas.

In Queensland, 16 REs meet the description for the listed Brigalow TEC. In the project area, the TEC corresponds to RE 11.3.1 *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains; and RE 11.9.5 *Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks. Both REs are classified as endangered under the VM Act.

EPBC Act survey requirements

There are no specific guidelines for survey requirements. Surveys of stands and offset areas were informed by:

- Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner et al., 2012)
- state government advice on biocondition survey approaches for threatened TECs
- Commonwealth listing advice.

Survey effort and observations

Table 8.1 details the survey dates and scopes for surveys undertaken from 2005 to 2013. Section 8.2.3 of this report (Assessment methodology) confirms the TEC and flora survey effort. Appendix G.5.4 provides vegetation survey data sheets from secondary, tertiary and biocondition surveys undertaken in June and August 2013. Vegetation mapping undertaken in the August 2013 survey event confirmed that the area of brigalow had increased.

A site located within the disturbance footprint had been cleared of an overstorey *Eucalyptus populnea* species, thereby changing it from RE 11.9.10 (not regarded as brigalow) to RE 11.9.5, which is categorised as brigalow TEC. Using calculations from instruments supporting the Commonwealth Environmental Offsets Policy (2012) surveys calculated the average condition of impacted brigalow TEC vegetation to be five out of 10.

The brigalow TEC areas were found to be impacted by clearing, weed invasion and grazing. The community patches were scattered and fragmented, with very limited connectivity to other vegetation.

No listed fauna that are usually associated with the community was located during surveys. One listed flora species, Belson's panic, was confirmed.

There are small isolated patches of the TEC across the southern part of the project site outside of mine footprint. This community is around 15m in height and comprises a canopy with *Acacia harpophylla* and *Casuarina cristata*. The understorey includes *Geijera parvifolia* (native willow) and *Eremophila mitchellii* (sandalbox).

There are moderate weed infestations present (up to 20 per cent) in some patches, including African boxthorn and Mayne's pest and tree pear.

Occurrence within project area

Figure 8.4 shows the locations of brigalow TEC at the project site. Seven small and isolated patches occur at site, totalling around 40ha, while 24.6ha occurs in the project footprint.

Impacts of the proposed action

Impacts associated with the project activities include loss of the brigalow TEC due to land clearance associated with construction and operation activities over a 13-year period.

Possible impacts include:

- over-grazing and trampling from APC activities
- indirect effects including pest and weed invasion, bushfire management, altered hydrogeological conditions, edge effects, dust, noise, artificial lighting, altered final landform, water quality and availability, waste and contamination.

Residual project impact

Surveys estimate the residual impact on the Brigalow TEC will total 24.6ha. The Brigalow TEC that will be impacted by the project is located within the footprint of the three mine pits. The construction of other mine infrastructure, including the rail spur, will not result in clearing of this TEC. The estimated total residual impact equates to a significant impact as per the *Commonwealth Significant Impact Guidelines 1.1* (2013) due to considerations including the possibility of the action interfering with the recovery of the species, and reducing the area of a population.

Conservation/listing advice, recovery plans and threat abatement plans

- Approved Conservation Advice for Brigalow (*Acacia harpophylla*) (dominant and co-dominant) ecological community (DE, 2013)
- There is no recovery plan for the TEC, however the Commonwealth has recommended one be developed.
- There is no threat abatement plan in place for the Brigalow TEC.

The primary threat for the TEC is continued clearing for agriculture and other purposes including mining. The approved conservation advice for the TEC confirms other threats include inappropriate grazing and fire regimes, competition with weeds, and use of habitat by pest animals, particularly pigs. Other pests such as goats, cane toads, cats, foxes and noisy miner birds (*Manorina melanocephala*) can significantly degrade the TEC's environmental values and diminish associated fauna species.

Threat reduction/control

Threat reduction and control measures included in the Commonwealth conservation advice for the TEC include:

- rehabilitating remaining remnant areas
- progressing research priorities, including how to assist regrowth to attain remnant brigalow characteristics
- developing fire management strategies for the TEC
- developing targeted pest and weed management plans, with a focus on pigs and high biomass exotic grasses.

Avoidance and mitigation measures

The clearing of the affected brigalow TEC is unavoidable due to the location of the coal resource.

The location of the rail spur has been positioned to avoid impacting 4.33ha of Brigalow TEC. A total of 2.71ha of scattered patches is located along Lagoon Creek, which will benefit from the proponent's commitment to preserve and enhance habitat in the creek conservation zone and exclude mining areas 150m each side of the riparian area. The proponent has committed to mitigation measures that seek to protect and enhance the ecological values at the project site. Such measures apply directly and indirectly to reducing impacts on MNES. These include:

- All remnant vegetation that does not require clearing will be protected from further disturbance (commitment 198).
- All vegetation clearance will be restricted to that necessary for the safe operation of mining activities (commitment 497).
- Lagoon Creek will not be diverted, minimising hydrogeological changes on site.
- A nature conservation zone of 50m either side of Lagoon Creek will be implemented, with mining excluded within 150m. The riparian values in the conservation zone will be enhanced (commitments 118, 120, 185, 190, 209). This has been conditioned as a requirement at Appendix 1. Areas to be cleared will have boundaries clearly marked. The demarcated boundaries will conform within the limits of design drawings and will comply with the mine's existing clearance procedures. Particular attention will be paid to defining the boundaries of clearing where MNES endangered ecological communities or listed species are present (commitment 496).
- Implementation of the Pest and Weed Management Plan and the Pest and Domestic Animal Management Plan (commitment 212).

- Final landforms, including voids, to be located outside of the PMF area.
- Contour banks will be constructed after profiling of the final landform to control run off, minimising hydrological disturbance.
- Continuous, staged, rehabilitation behind mining operations to minimise disturbance.
- Continued use of existing mine structures (CHPP; MIA; MHF) to avoid new land disturbance.
- In-pit tailings disposal and management to avoid new structures and additional land disturbance.
- Conditioned requirement to not pollute ground and surface water resources.
- Waste management plan to avoid contamination and ineffective disposal and handling of toxicants.
- Hazard and risk management plan.
- The recommended condition requiring pre-clearing surveys for listed species.
- Vegetation clearing to be during the day and one-directional, to allow fauna to escape.
- Surface water management measures including clean water diversion, flood levees, diversion drains, sediment control structures, storage dams have been committed to and conditioned to avoid and minimise environmental harm (Appendix 2).
- Extensive dust control measures conditioned at Appendix 2.
- Bushfire prevention and management measures; fire management plan.
- Machinery bought on to site will be required to be weed-free. Advice will be sought on local weeds from DAFF (commitment 565) and Toowoomba Regional Council.
- Delivery of an Erosion and Sediment Management Plan (commitment 232), conditioned at Appendix 2.
- The EM Plan (AEIS) states light sources will be fitted with shielding devices to reduce and remove light pollution. Where possible, lighting required for the project site will be oriented inwards, focusing on areas requiring illumination and screened from the outside.

Extensive dust mitigation and management strategies that I have conditioned are discussed in Section 5.3 of this report.

To the extent that impacts can be mitigated, I consider the measures proposed for the protection of the brigalow TEC, along with my recommended conditions, will be sufficient. However, as mitigation alone is not sufficient to reduce the likely residual impact to the brigalow TEC, an offset is required.

Offsets

I have determined that the 24.6ha of brigalow TEC to be cleared will constitute a significant residual impact and require offsetting. Given the impact will result in the loss of a portion of an already diminished ecological community in an area that has been subject to broadscale clearing, offsets will be required to ensure there is no net loss to this threatened value.

The proponent has proposed an offset area of 60ha to account for the clearing of 24.6ha of brigalow TEC. The offset is to be secured in perpetuity to protect the area. Rehabilitation of the offset site is proposed to remove threats and lead to improved environmental values at the site.

The proponent has confirmed discussions are underway with a third party landholder to seek agreement for brigalow TEC to be established on their property. As these negotiations are not yet complete, the offset area has not been assessed in detail.

Other options are also being considered in order to secure a suitable offset within the bioregion.

Coordinator-General's conclusion—brigalow TEC

The proponent has committed to a range of mitigation and management measures which will work to reduce the impact on remaining brigalow TEC at site.

I support the proponent's commitment to secure 60ha of offset area to address the residual impact by the project on 24.6ha of brigalow TEC will achieve a net gain to the threatened community.

I recommend the following conditions of approval to the Commonwealth Environment Minister regarding the brigalow TEC:

- the proponent is conditioned to a maximum disturbance limit of 24.6ha to limit impacts on brigalow TEC
- the MMP is to include appropriate avoidance and management measures to protect and enhance the remaining brigalow TEC at the project site. The MMP is to consider strategies and advice provided in the TEC's conservation advice
- the proponent provide offsets for authorised unavoidable impacts to 24.6ha of brigalow TEC in accordance with the EPBC Act Environmental Offsets policy (October 2012)
- the proponent is to address offsets provision and management strategies for the brigalow TEC in the project's OAMP.

I am of the view that, given the above measures and controls, the proposed action will not have an unacceptable impact on the brigalow TEC.

Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions

EPBC Act listing status: endangered

Description

Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT), are a dry, seasonal, subtropical rainforest, generally characterised as a mix of evergreen, semi-evergreen and deciduous emergent tree species, populated with vines and twining or scrambling plants.

The thickets typically have an uneven canopy that is around 4-9 metres high. SEVT communities frequently include the iconic ‘bottle trees’ (*Brachychiton australis*, *B. rupestris*), therefore the community is commonly referred to as bottle tree scrub.

Distribution

The SEVT TEC extends from Townsville in Queensland to northern New South Wales. It is mostly located within the Brigalow Belt bioregion. SEVT TECs occur in seasonally dry areas on high to medium fertility soils. They are most common on undulating plains of fine-grain sedimentary rocks, and on basalt hills and plains.

Sections of original SEVT forests were removed for agriculture. In 2003, with less than 150,000ha of their original extent remaining, remnant SEVT TECs in Queensland and upper New South Wales were estimated to have been reduced from their original extent by around 83 per cent. At that time, it was estimated that approximately 37,000ha of remaining SEVT communities were located in protected parks and forests.

EPBC Act survey requirements/techniques

No specific guidelines for SEVT survey requirements exist. The *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al. 2012) informed the survey effort, along with the TEC listing advice.

Survey effort and observations

Table 8.1 details the survey dates and scope for surveys undertaken from 2005 to 2013. Section 8.2.3 of this report (Assessment methodology) confirms the TEC and flora survey effort.

Occurrence within project area

Figure 8.4 indicates two separate areas of SEVT were confirmed in the project area. One is located outside the MLA to the south-east of Acland, on land owned by the proponent. The other, a single small patch of SEVT of less than 2ha in size, was located on the project site in the north-western section of the MLA. It is a thin patch, located on a hilltop and is estimated to be less than 250m wide.

A 2013 survey confirmed the on-site community is located outside the disturbance footprint of the project, at around 100m to the west of the Manning Vale West mine pit. Surveys confirmed the canopy is generally 10–12 metres high with 5–10 per cent cover. The dominant species is belah (*Casuarina cristata*). Other softwood scrub species are evident, including scrub cherry (*Exocarpos latifolius*), *Flindersia sp.*, and *Capparis sp.*

The fragment of a SEVT TEC constitutes less than 0.1 per cent of the vegetation of the study area, with its condition indicated as being poor. The 2013 survey results indicated the shrub layer is heavily modified and often includes the noxious weed, african boxthorn (*Lycium ferocissimum*) as a dominant species and currant bush (*Carissa ovate*), with both species found in sporadic, dense clumps. The ground layer is bare, with some areas of sparsely grassed cover. The community has been affected

by grazing, selective logging, moderate weed infestation and pests, such as foxes and pigs.

No listed fauna species were recorded in the TEC patch.

Impacts of the proposed action

There are no direct project impacts that will occur from vegetation clearing as the SEVT TEC stand is not in the project footprint. However, over-grazing and trampling from APC activities could occur.

Indirect effects may arise due to pest and weed invasion, bushfire management, altered hydrogeological conditions, edge effects, dust, noise, artificial lighting, water quality and availability, waste and contamination.

Modelling indicates that groundwater drawdown in the vicinity of the TEC will occur during and post-mining (refer to Section 8.3 of this report).

Residual impact

There are no residual impacts on the SEVT TEC known at this time.

Recovery plans, conservation advices and threat abatement plans

- There is no approved conservation advice for the SEVT TEC.
- Recovery plan—*National recovery plan for the Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions ecological community* (McDonald, W.J.F, 2010)
- There is no threat abatement plan in place for the SEVT TEC.

The recovery advice confirms key threats to the TEC include clearing, fire, weeds, grazing, and vertebrate pests. The overall recovery objective is to conserve and maintain the SEVT's environmental values by minimising further loss and improving the condition and management of remaining communities.

Recovery actions include:

- research and develop use of SEVT species for rehabilitation
- develop and implement a pest and weed management program
- grazing management and control
- minimise fire damage.

Avoidance and mitigation measures

The proponent has committed to mitigation measures that seek to protect and enhance the ecological values at the project site. Such measures apply directly and indirectly to reducing impacts on MNES. These include:

- All remnant vegetation that does not require clearing will be protected from further disturbance (commitment 198).
- All vegetation clearance will be restricted to that necessary for the safe operation of mining activities (commitment 497).

- NAC has confirmed pit boundaries are designed with buffer zones to ensure sensitive areas, including threatened vegetation to be retained, are not impacted. Pit boundaries are surveyed and pegged, and boundaries regularly checked against disturbance coordinates.
- Mine machinery has GPS equipment which sounds a warning if the equipment approaches a 'no go' zone. The SEVT TEC area would be defined as such, including within site management plans and the plan of operations. In this way, accidental clearing or disturbance would be avoided.
- Lagoon Creek will not be diverted, minimising hydrogeological changes on site.
- A nature conservation zone of 50 metres either side of Lagoon Creek will be implemented, with mining excluded within 150 metres. The riparian values in the conservation zone will be enhanced (commitments 118, 120, 185, 190, 209 Appendix D, AEIS). This has been conditioned as a requirement at Appendix 1.
- Areas to be cleared will have boundaries clearly marked. The demarcated boundaries will conform within the limits of design drawings and will comply with the mine's existing clearance procedures.
- Particular attention will be paid to defining the boundaries of clearing where MNES endangered ecological communities or listed species are present (commitment 496).
- Implementation of the Pest and Weed Management Plan and the Pest and Domestic Animal Management Plan (commitment 212).
- Final landforms, including voids, to be located outside of the PMF area.
- Surface water management measures including clean water diversion, flood levees, diversion drains, sediment control structures, storage dams have been committed to and conditioned to avoid and minimise environmental harm (Appendix 2).
- Contour banks will be constructed after profiling of the final landform to control run off, minimising hydrological disturbance.
- Continued use of existing mine structures (CHPP; MIA; MHF) to avoid new land disturbance.
- In-pit tailings disposal and management to avoid new structures and additional land disturbance.
- Conditioned requirement to not pollute ground and surface water resources.
- Waste management plan to avoid contamination and ineffective disposal and handling of toxicants.
- Hazard and risk management plan.
- The recommended condition requiring pre-clearing surveys for listed species.
- Vegetation clearing to be during the day and one-directional, to allow fauna to escape.
- The main post-mine land use at the project will be grazing based on a self-sustaining vegetation community using appropriate pasture grasses and scattered plantings of native tree and shrub species.
- Extensive dust control measures conditioned at Appendix 2.
- Bushfire prevention and management measures; fire management plan.

- Continuous, staged, rehabilitation behind mining operations to minimise disturbance.
- Machinery bought on to site will be required to be weed-free. Advice will be sought on local weeds from the State Department of Agriculture, Fisheries and Forestry (DAFF) (commitment 565) and Toowoomba Regional Council.
- Delivery of an Erosion and Sediment Management Plan (commitment 232), conditioned at Appendix 2.
- The EM Plan (AEIS) states light sources will be fitted with shielding devices to reduce and remove light pollution. Where possible, lighting required for the project site will be oriented inwards, focusing on areas requiring illumination and screened from the outside.
- Extensive dust mitigation and management strategies that I have conditioned are discussed in Section 5.3 of this report.

To the extent that impacts can be mitigated, I consider the measures proposed for the protection of the SEVT TEC along with my recommended conditions will be such that no offsets are required.

Offsets

No offsets are required for SEVT TEC.

Coordinator-General's conclusion – SEVT

I note that the area of SEVT on the project site is a small and isolated fragment of the TEC with poor environmental values. I acknowledge that the area will not be directly disturbed by project activities.

However, in line with the recovery plan for the SEVT TEC, I concur that all remaining SEVT TECs should be retained and protected where possible.

I therefore recommend a condition of approval to the Commonwealth Minister for the Environment (Appendix 3) that the proponent develop, as a component of its MMP, an SEVT Action Plan to ensure no net loss to this community on the project site.

The plan is to address how the area will be enhanced and protected from mine activities. It is to address the potential for impact, including for clearing and extraction works occurring in the vicinity of the site, and propose management strategies in accordance with the Commonwealth's approved recovery plan for the community.

Given the proximity of this community to a mine pit and that it will often be downstream of prevailing winds, dust controls should also be considered in the plan. The proponent should also consider ensuring grazing activities of the APC are excluded from the vicinity of the SEVT TEC.

In light of the TEC being in the groundwater drawdown impact area, the MMP is to detail the process for verifying if the SEVT is groundwater dependent. Should this be confirmed, the proponent is required to develop a long-term monitoring program to ascertain if groundwater impacts will affect the SEVT stand. Reporting on findings to the Commonwealth Minister for the Environment is required and will inform a future decision on if any offset is required.

I am of the view that the proposed action will not have an unacceptable impact on SEVT TEC provided the mitigation measures are carried out and the recommended conditions are satisfied.

Homopholis belsonii

EPBC Act listing status: vulnerable

Description

Belson's panic grass (*Homopholis belsonii*) is a perennial grass that grows up to 50cm in height, with smooth leaves around 0.8–1.5mm long with blades that range from 2–4.5mm wide.

Distribution

The species is found in the southern Brigalow Belt. It has been recorded in the Darling Downs west of Toowoomba, near Oakey, Jondaryan, Bowenville, Dalby, Acland, Sabine, Quinalow, Goombungee, Gurulmundi and Millmerran, and further west between Miles and Roma (Queensland Herbarium, 2008). It is also confirmed in northern New South Wales.

Belson's panic is associated with REs 11.8.5a: *Eucalyptus orgadophila* woodland, 11.9.10 *Eucalyptus populnea*, *Acacia harpophylla* open-forest on fine-grained sedimentary rocks; and 11.3.17 *Eucalyptus populnea* woodland with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains.

The latter two REs are confirmed in the project area and are associated with the Brigalow TEC. It is thought the species has the ability to readily recolonise in cleared or disturbed areas, as it is often found in roadside verges.

EPBC Act survey requirements/techniques

There are no specific guidelines for Belson's panic survey requirements. Surveys were informed by the Commonwealth listing advice for the species.

Survey effort and observations

Surveys that considered threatened flora were undertaken four times from 2007 to 2013 (see Table 8.1). Section 8.2.3 of this report (Assessment methodology) confirms the flora survey effort.

Belson's panic was recorded in remnant and non-remnant habitats associated with *Eucalyptus orgadophila*, *E. populnea* and *Acacia harpophylla* dominated forest and woodlands with a mid-tree stratum dominated by wilga (*Geijera parvifolia*) on basalt hills and alluvium.

Where Belson's panic was confirmed, it was growing in shaded areas under trees and fallen logs. The species was also found in the BDG community in the Manning Vale West and Willaroo pits. The species was also found in the shelter of trees in brigalow and poplar box communities.

Surveys of the impacted species determined the quality of the vegetation (as defined by instruments supporting the Commonwealth Environmental Offsets Policy (2012)) equated to 5 out of 10.

This assessment is supported by the view that sites were found to be impacted by clearing, weeds, and grazing. Patches of the species are scattered, with limited connectivity to other vegetation. The species prevalence at sites was average.

Occurrence within project area

Belson's panic was found at numerous locations throughout the project area. No occurrences were recorded along the rail spur—see Figure 8.4.

Impacts of the proposed action

Impacts associated with the proposed project activities include species loss due to land clearance associated with construction and operation activities over a 13-year period

Possible impacts include:

- over-grazing, trampling from APC activities
- indirect effects including pest and weed invasion, bushfire management, altered hydrogeological conditions, dust, edge effects, noise, artificial lighting, water quality and availability, waste and contamination.

Residual impact

Twelve patches of Belson's panic will be cleared due to the project works for the Manning Vale West and the Willaroo pits. These patches are associated with the bluegrass grassland community, and equate to an estimated residual impact of 70.8ha.

This equates to a significant impact as per the *Commonwealth Significant Impact Guidelines 1.1* (2013) due to considerations including the possibility of the action interfering substantially with the recovery of the species and reducing the area of an important population.

Conservation advice, recovery plans and threat abatement plans

- Commonwealth Approved Conservation Advice for *Homopholis belsonii* (Threatened Species Scientific Committee (2008))
- The Commonwealth has decided a Recovery Plan for the species is not required.
- There is no threat abatement plan in place for *Homopholis belsonii*.

The approved conservation advice for Belson's panic confirms that key threats to the species include clearing of habitat for agriculture and mining, overgrazing, and competition with weeds.

Mitigation measures advised by the Commonwealth conservation advice for the species include:

- control public access to sites where the species is confirmed
- minimise adverse impacts from land use at known sites

- develop and implement appropriate grazing regimes for grazing areas
- develop fire management strategies for the TEC
- develop targeted weed management plans, with a focus on weeds that could become a threat to the species, and preventing the introduction of invasive weeds (for example, green panic grass, (*Panicum maximum* var. *trichoglume*), coolatai grass (*Hyparrhenia hirta*) and tiger pear (*Opuntia aurantiaca*).

Mitigation measures

The impact on around 70.8ha of Belson's panic grass is unavoidable due to its prevalence within communities on the resource areas proposed to be mined.

The proponent has committed to mitigation measures that seek to protect and enhance the ecological values at the project site. Such measures apply directly and indirectly to reducing impacts on MNES. These include:

- All remnant vegetation that does not require clearing will be protected from further disturbance (commitment 198).
- All vegetation clearance will be restricted to that necessary for the safe operation of mining activities (commitment 497).
- Lagoon Creek will not be diverted, minimising hydrogeological changes onsite
- A nature conservation zone of 50 metres either side of Lagoon Creek will be implemented, with mining excluded within 150 metres. The riparian values in the conservation zone will be enhanced (commitments 118, 120, 185, 190, 209 Appendix D, AEIS).
This has been conditioned as a requirement at Appendix 1.
- Areas to be cleared will have boundaries clearly marked. The demarcated boundaries will conform within the limits of design drawings and will comply with the mine's existing clearance procedures. Particular attention will be paid to defining the boundaries of clearing where MNES endangered ecological communities or listed species are present (commitment 496).
- Implementation of the Pest and Weed Management Plan and the Pest and Domestic Animal Management Plan (commitment 212).
- Final landforms, including voids, to be located outside of the PMF area.
- Surface water management measures including flood levees, diversion drains, sediment control structures, storage dams have been conditioned to avoid and minimise environmental harm (Appendix 2).
- Contour banks will be constructed after profiling of the final landform to control run off, minimising hydrological disturbance.
- Extensive dust control measures conditioned at Appendix 2.
- Bushfire prevention and management measures; fire management plan.
- Machinery brought on to site will be required to be weed-free. Advice will be sought on local weeds from the State Department of Agriculture, Fisheries and Forestry (DAFF) (commitment 565) and Toowoomba Regional Council.
- Delivery of an Erosion and Sediment Management Plan (commitment 232).

- The EM Plan (AEIS) states light sources will be fitted with shielding devices to reduce and remove light pollution. Where possible, lighting required for the project site will be oriented inwards, focusing on areas requiring illumination and screened from the outside.
- Extensive dust mitigation and management strategies that I have conditioned are discussed in Section 5.3 of this report.
- Continued use of existing mine structures (CHPP; MIA; MHF) to avoid new land disturbance.
- In-pit tailings disposal and management to avoid new structures and additional land disturbance.
- Conditioned requirement to not pollute ground and surface water resources.
- Waste management plan to avoid contamination and ineffective disposal and handling of toxicants.
- Hazard and risk management plan.
- The recommended condition requiring pre-clearing surveys for listed species.
- Vegetation clearing to be during the day and one-directional, to allow fauna to escape.

To the extent that impacts can be mitigated, I consider the measures proposed for the protection of Belson's panic along with my recommended conditions will be sufficient. However, as mitigation alone is not sufficient to reduce the likely residual impact to the Belson's panic, an offset is required.

Offsets

I have determined that the 70.8ha of Belson's Panic to be cleared will constitute a significant residual impact and require offsetting.

The proponent has stated an offset of 90ha will be provided for this species. The offset will be located within the 247ha area available for offset sites on land owned by the proponent to the south of the project. Figure 8.4 provides the proposed locations.

The proponent's stated aim is to ensure the translocated species is assessable as a future quality of 8 out of 10.

Threatened Species Translocation Plan

The proponent has prepared a Threatened Species Translocation Plan (TSTP), which provides the proposed methodology for removing and relocating species. The TSTP includes targeted methods to successfully translocate plants, by ensuring new locations are prepared and tended to minimise plant stress and remove competition with weeds. Firebreaks will also be installed.

Regular watering will take into account the soil type at the new site to avoid under- or over-watering. Translocation sites will be demarcated into separate zones, tagged via GPS, that are inspected multiple times during a week in the early stages, and then weekly until the plants are established, for a minimum of one year. Corrective and maintenance actions will be undertaken during inspections.

During the establishment period, a qualified ecologist will monitor each site, including:

- assessment of soil to determine watering requirements
- weekly assessment of ecological health
- bi-monthly ecological condition assessment using state government advices
- bi-monthly weed and exotic plant abundance assessment.

When the plants are established, monitoring will occur every six months for five years.

The proponent proposes to provide a bi-annual report to DE providing the monitoring results and corrective and maintenance actions that occurred in the preceding period, until successful establishment of the relocated plants is able to be scientifically confirmed.

While unlikely to be required given the area's weather conditions, the proponent is open to extending the above monitoring and reporting period should a low rainfall period not occur, as understanding the success of the relocated species during such an event will be important to understanding the sustainability of the TSTP.

Coordinator-General's conclusion—*Homopholis belsonii*

I am satisfied that the proposed TSTP provides a considered and informed program of works to ensure the successful relocation of a vulnerable native species, with regular and extended monitoring and reporting to demonstrate that the desired outcome of the plan is achieved.

Importantly, the TSTP is informed by the successful translocation of Belson's panic undertaken by the proponent for the mine's Wetalla Water Pipeline Project in 2008. All 18 translocated plants survived relocation, and most specimens produced stolons that developed into new tussocks.

For the protection of this species, I recommend a condition that places a maximum disturbance limit of 70.8ha of Belson's panic. I also recommend a condition of approval to the Commonwealth Environment Minister that *Homopholis belsonii* be included in the project's MMP, citing the TSTP as the key mechanism for management of affected species.

The MMP is to also describe how populations on the project site not affected by project works will be protected and enhanced. In addition, any occurrences of the species found during pre-clearing surveys are to be managed as described in the MMP. I recommend a condition that the proponent provide offsets for authorised unavoidable impacts to 70.6ha of Belson's panic in accordance with the EPBC Act Environmental Offsets policy (October 2012).

I have also recommended a condition of approval (Appendix 3) that the proponent include Belson's panic in the project's OAMP.

Given the above controls, I am satisfied the proposed action will not have an unacceptable impact on Belson's panic grass.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

EPBC Act listing status: vulnerable

Description

The grey-headed Flying-fox (*Pteropus poliocephalus*) (GHFF) is the largest of Australia's bats with a wingspan of up to 1m. The GHFF is a social and nocturnal species that gathers in camps (usually in trees) during the day. Depending on the availability of food, camps can number in the tens of thousands.

GHFF can forage up to 50km, but usually travels within 15km in the search for food. While orchards are sometimes targeted for food, the species prefers nectar and pollen from natives such as eucalypts, melaleucas and banksias.

The issue of the species listing and its management has been subject to ongoing discussion, due both to the perceived presence of the population and the interactions GHFFs continue to have with commercial orchards and other human activities. In Queensland, the government allows for the lethal control of a limited number of individuals for crop protection purposes.

Distribution

The species ranges from Bundaberg in Queensland to Melbourne in Victoria. The species' decline in numbers was estimated in 2001 to be in the order of around 30 per cent since 1989 assumptions about population size.

EPBC Act survey requirements/techniques

In 2010 the Commonwealth published survey guidelines for the GHFF. A number of Queensland and New South Wales state government publications provide advice and policy about the species.

Survey effort and observations

Surveys for fauna relating to the stage 2 operation occurred in 1998, 1999 and 2005.

For the stage 3 project, fauna surveys occurred from 26 February to 2 March 2007 (late summer-early spring) and 20 November 2008 (late spring), and during October – November 2013 (mid-late spring). Section 8.2.3 of this chapter provides an overview of the survey approach undertaken for the species.

Occurrence within project area

One individual GHFF was spotted on site in 1999, however its location was not recorded.

Impacts of the proposed action

Possible project-related impacts include:

- clearance of foraging and breeding habitat

- indirect effects on habitat including pest and weed invasion, bushfire management, altered hydrogeological conditions, dust, noise, edge effects, artificial lighting, altered final landform, water quality and availability, waste and contamination.

Residual impact

GHFF camps are known in the vicinity of Toowoomba, which is around 35km east of the project site. The proponent has advised that no camps for the species are present in the project area.

However, 280ha of suitable foraging habitat is available on the project site, including communities of poplar box, mountain coolabah and gum-topped box woodlands.

The area of suitable GHFF foraging habitat that will be cleared by project works is estimated to be around 76ha. A total of 204ha of potential foraging habitat for the GHFF will remain on site following project clearing. The proponent has calculated that with the species able to travel up to 50km from a camp to forage, for the Toowoomba camps, an area of 785,700ha is available for the species to find food. Within this area, better quality foraging habitat is available closer to camps, including in the Bunya Mountains National Park, Crows Nest National Park and in nature reserves.

It is noted that overall, habitat in the project site for native species is of poor quality due to significant historical clearing and modification. Remaining vegetation is mostly limited to the ephemeral creek and other scattered patches.

Conservation advice, recovery plans and threat abatement plans

No conservation advice has been produced for GHFF.

In 2009, the Commonwealth confirmed a recovery plan for the GHFF was required. A draft national recovery plan for the species was issued in July 2009.

The draft recovery plan for the species confirms key known threats are habitat loss; deliberate destruction associated with their impact on commercial horticulture; negative public attitudes and human conflict; powerline electrocution and entanglement in nets and barbed wire.

Mitigation measures

General mitigation measures the proponent will implement that have been previously discussed, such as restricting vegetation clearing, protecting remaining threatened vegetation from disturbance, restoring riparian areas, and implementing pest and weed management plans, will apply to possible foraging habitat that visiting individual GHFFs may utilise.

The commitment to implement a nature conservation zone at the extent of Lagoon Creek across the project site, and to enhance the riparian values, will also work to preserve existing habitat and encourage future foraging trees for the GHFF.

To the extent that impacts can be mitigated, I consider the measures proposed for the protection of the GHFF along with my recommended conditions will be such that no offsets are required. However, offsets for REs affected by project clearing such as poplar box and gum-topped box will be required by the state government. Further

information on this is available in Section 5.6 (Ecology). These offsets may provide habitat of use to GHFF.

Coordinator-General's conclusion—grey-headed flying fox

I note that over the course of 14 years of surveys, only one individual of the species was confirmed in 1999. However, the existence on site of suitable feeding habitat for the GHFF is also acknowledged.

My conclusion is that no conditions relating to this MNES are necessary as I am satisfied the proposed action will not have an unacceptable impact on the GHFF. My reasons for this are:

- the general condition of the site is of low ecological value largely due to historical clearing for agriculture
- 204ha of potential foraging vegetation will not be subject to clearing
- the species has an extensive foraging range, with better quality habitat available closer to known camps
- while 76ha of potential foraging habitat will be impacted, the requirement for mitigation measures, including those either conditioned by me within this report, or committed to by the proponent for maintaining and enhancing environmental conditions on site in general, are adequate.

Confirmed MNES: indirect impacts

Dust from mining, blasting, conveyors, and stockpiles could impact MNES species and ecological communities.

The EIS finds that model calculations on a cotton crop suggest that dust deposition rates of 1,000mg/m²/day is predicted to result in measurable reductions in crop growth during overcast weather, but the effect may be more difficult to detect in sunny weather. A deposition rate of 500mg/m²/day is unlikely to have a detectable effect on vegetative growth (Doley 2003).

It is predicted that daily dust deposition rates at residential receptors close to the mining lease boundary, at the maximum, are at 22 per cent of the level identified by Doley (2003) as having an impact on crops. The dust deposition modelling shows the highest predicted level of dust deposition to be 218mg/m²/day, predicted to occur in 2029 at the end of mining. Therefore, I consider that indirect impacts to MNES as a result of dust deposition are unlikely. However, I have required in recommended conditions discussed in this chapter that MNES management plans consider dust effects.

Other potential indirect effects such as noise, illumination, water, waste, weeds, pests and hydrogeological changes are required to be considered in the conditioned MMP. Extensive conditions have been applied by me to control these matters and minimise environmental harm (appendices 1–3). I am therefore satisfied that indirect effects on MNES are manageable and do not present unacceptable impacts on species.

Offsets for impacts to MNES

The proponent prepared an EOS which seeks to take into account both state and Federal offset requirements.

The EOS has developed in accordance with the Queensland Offsets Policy (2014) and the EPBC Act Environmental Offsets Policy (2012), and informed by ongoing advice from EHP and DE.

The EOS details the project's residual impacts on MNES that require offsets, and proposes how to achieve the offset obligations. The EOS confirms residual impacts will be experienced by five environmental values: being two TECs and three flora.

Table 8.3 provides an overview of the residual impact and proposed direct, land-based offsets to account for the loss of areas of two TECs and one flora species.

Table 8.3 MNES species: project impacts and offsets

Name	Residual impact (ha)	Offset (ha)
Listed TECs		
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) (endangered)	24.6	60
Bluegrass dominant grasslands of the Brigalow Belt Bioregions (North and South) (endangered)	40.1	90
Flora		
Belson's panic grass (<i>Homopholis belsonii</i>) (Vulnerable)	70.8	87
TOTAL	135.5	237

8.2.6 MNES species possibly located on site

Table 8.4 lists four species that a search of the EPBC Act Protected Matters Database stated may possibly be present at the project site.

These species, while not located during field surveys, were regarded as possibly occurring due to the presence of suitable habitat.

The recommended condition that the MMP include pre-clearance surveys for MNES that may be located during project works will help determine if the species is present, and how impacts on the discovered MNES is to be managed and reported to DE.

Table 8.4 Listed threatened species of plants possibly located on site

Name	Status
<i>Dichanthium queenslandicum</i> , king blue-grass	Endangered
<i>Picris evae</i> , hawkweed	Vulnerable
<i>Thesium austral</i> , austral toadflax, toadflax	Vulnerable
<i>Rhaponticum australe</i> , austral cornflower, native thistle	Vulnerable

Section 8.2.3 provides details of the survey effort undertaken for listed flora. While suitable habitat for *Dichanthium queenslandicum*, (king blue-grass), *Picris evae*, (hawkweed), and *Thesium australe* (austral toadflax) is available at site, no site surveys located the species. *Rhaponticum australe* (austral cornflower) was however found adjacent to the project site.

Austral cornflower

Description

The austral cornflower (*Rhaponticum australe*), commonly known as the native thistle, is an erect, herbaceous perennial that grows up to 60cm in height. Its flowers are deeply toothed, purplish, and clustered into terminal heads.

Distribution

The approved Commonwealth Conservation Advice for the Austral Cornflower (2008) confirms the species is known across a 600-kilometre-stretch of Queensland, extending in a corridor from the Carnarvon National Park to Gatton.

The austral cornflower is often found in woodland and grassland and in association with *Eucalyptus crebra* (narrow-leaved ironbark), *E. orgadophila* (mountain coolibah), *E. populnea* (poplar box), *E. tereticornis* (forest red gum), *E. melanophloia* (silver-leaved ironbark), *Angophora subvelutina* (broad-leaved apple), *A. floribunda* (rough-barked apple), *Cirsium vulgare* (spear thistle [introduced species]), *Dichanthium sericeum* (Queensland bluegrass) and *Themeda triandra* (kangaroo grass).

In 2009, the Commonwealth deemed that a recovery plan for the species was not required. However, the species approved conservation advice contains information and actions intended to aid its recovery. The recommended actions are directed at managing issues including habitat loss, disturbance, weeds, and grazing pressure.

Key threats to the austral cornflower include broad-scale vegetation clearing, road works, trampling and grazing pressures and competition with exotic weeds, including rhodes grass. The species is considered to be a poor competitor and prefers habitat where grass competition has been reduced.

EPBC Act survey requirements/techniques

There are no specific guidelines that indicate survey requirements for the species. Surveys were informed by the Commonwealth listing advice.

Survey effort

Surveys that considered threatened flora were undertaken four times from 2007 to 2013 (see Table 8.1). Section 8.2.3 of this chapter (Assessment methodology) confirms the flora survey effort.

Occurrence within project area

Figure 8.3 shows the locations across the project site where REs and threatened flora were located. The map confirms the austral cornflower was located at three sites near the proposed rail spur.

While the map appears to show the proposed rail spur traverses one site where the species was found, the proponent has advised this is due to the scale of the map. The location data for the austral cornflower was captured during site surveys using a hand-held GPS that had a tolerance of 16m.

The proponent has confirmed the three sites where the species were located are within the road reserve of the Jondaryan-Muldu Road. The proposed rail spur is located in an adjacent property outside the road reserve, with the location not affected by the spur.

The species was not confirmed at any other location in the project area. However, the species may occur in suitable habitat that is to be cleared for the project, including isolated fragments of forest red gum, poplar box, mountain coolibah, and affected areas of Queensland bluegrass.

Impacts of the proposed action

Possible impacts include indirect effects including pest and weed invasion, water quality and bushfire management.

Due to its proximity to the rail spur, indirect impacts may occur due to the infrastructure's potential effects on hydrogeological conditions, dust, and noise.

Residual impact

No significant residual impact on the species is likely to occur from the project works

Recovery plans, conservation advices and threat abatement plans

- Commonwealth Conservation Advice on *Stemmacantha australis* (Threatened Species Scientific Committee, 2008).
- The Commonwealth has decided a recovery plan for the species is not required.
- There is no specific threat abatement plan for the austral cornflower.

Threats to the species include:

- land clearing
- habitat fragmentation
- grazing pressures
- competition with weeds
- road works and maintenance in road or rail corridors where the species may be found.

Threat abatement actions advised by the conservation advice include:

- minimise grazing
- monitor known species to manage threats

- control access routes to exclude the public
- ensure road widening does not impact on the species.

Avoidance and mitigation measures

The project is not likely to directly impact on the austral cornflower. Mitigation measures previously described for listed species confirmed at the project site are relevant for indirect impacts to the austral cornflower, these include management of dust, land impacts, soil and erosion, water, waste, contaminants.

Coordinator-General's conclusion: MNES that may be found on site

While suitable habitat for the king blue-grass exists on-site, it is acknowledged the species was not located during site surveys, including in areas that would be favourable to the species—such as project-affected areas of brigalow and bluegrass TECs.

With regard to the austral cornflower, the proponent has confirmed the species was not located on the project site during surveys. Such surveys included areas of Queensland blue-grass, poplar box and other eucalypts, and road reserves, which may provide suitable habitat.

However, as the species was located in three areas adjacent to the proposed rail spur, and that suitable habitat as described in the species conservation advice is located in the project area, it is considered likely that the species may be found on site, and possibly in areas to be cleared or disturbed for project works. If accepted by the minister, the MMP is to address the potential for impact on the austral cornflower and propose management strategies in accordance with the Commonwealth's approved conservation advice for the species.

As part of the MMP relating to austral cornflower, the proponent may consider measures such as introducing (or, if the species is located on site, reintroducing) the species into suitable areas on site. Particular attention would be best focused on areas that are to be managed to reduce recognised threats to the species, such as weeds and grazing.

The MMP is to address how the species may be impacted by road works to be undertaken by the project, and how impacts are to be avoided to ensure no net loss due to project works.

In addition, I recommend a further condition to the Minister for the Environment that, although the species have not been identified on-site, the MMP include management and mitigation measures to address potential impacts to *Dichanthium queenslandicum*, (king blue-grass), *Picris evae*, (hawkweed), and *Thesium austral* (austral toadflax).

To the extent that impacts can be mitigated, I consider the measures proposed to protect *Rhaponticum australe* (austral cornflower), *Dichanthium queenslandicum*, (king blue-grass), *Picris evae*, (hawkweed), and *Thesium austral* (austral toadflax) along with my recommended conditions will be such that there is not likely to be a significant residual impact to these species.

8.2.7 Species unlikely to be present on-site

Survey findings

Table 8.5 describes species identified in the EPBC Act Protected Matters Database as possibly being present, but that were not located on site during field surveys.

The table includes the survey effort applied for each species, and includes surveys that were undertaken for stage 2 of the mine, as these informed the stage 3 project survey effort.

A rationale is provided as to why each species was not regarded as likely to be present on site. The information has been collated from Appendices 20 and G.5 of the EIS (2014).

Table 8.5 MNES species unlikely to be present on-site

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
TECs					
White Box- Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland (critically endangered)	The TEC listing advice was used as a guide to determine the presence of the community.	One event performed during previous project (stage 2)	August 2005 (stage 2)	Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner et al 2012)	
		One event performed to inform the stage 3 project	Feb/March 2007		
Type: Birds (8)					
<i>Lathamus discolor</i> , Swift parrot (endangered)	Early morning and afternoon surveys of dry sclerophyll eucalypt forests and woodlands. Targeted searches of heavily flowering eucalypts may be useful. Area searches or transect surveys (20h 8d), Targeted surveys (20h 8d). Timing between March and July.	30 minute counts at three sites over three nights.	26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened birds	Species is known to have a high degree of site fidelity, and as no previous records of the species are known from the project site, it is concluded that this species is not present.
		12 hours over 3 days traversing waterway and flushing through suitable habitat Total: 28.5 hours	Oct–Nov 2013		

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Neochmia ruficauda</i> , star finch (eastern), star finch (southern) (endangered)	Surveys of rank grasses in riparian areas, also within flocks of other finch species. Target searches of waterholes may be useful in dry season. Area searches or transect-point surveys (15h 5d), Broadcast surveys (15h 3d), Targeted surveys (10h 4d)	Dawn and dusk observation (incl. call IDs), opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights. Total: 16.5 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened birds	Population believed to be between Bowen, Winton and Wowan – north of the revised Project site. Project site is outside the range of the Star Finch.
<i>Poephila cincta cincta</i> , black-throated finch (southern) (endangered)	Survey suitable waterholes and savanna woodland. Landbased area searches (10h 5d), Targeted searches (6h 2d)	Dawn and dusk observation (including call IDs), opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights Total: 16.5 Hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened birds	Prefers grassy open woodlands and forests dominated by Eucalyptus, Corymbia and Melaleuca. Usually associated with riparian vegetation. The project site does not encompass habitat that is likely to be inhabited by the species.
<i>Xanthomyza Phrygia</i> , regent honeyeater (endangered)	Surveys (pref. morning) in suitable habitat (wet, eucalypt forests with heavily flowering trees). Area searches (20h 10d), Targeted searches (20h 5d)	Dawn and dusk observation (including call IDs), opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights Ecologists on 10 days (39.5 hours). Plus 2 hours by 2 ecologists in wooded section of waterway (4 hours). Total: 60 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened birds	Species use moister fertile sites in dry box-ironbark woodland and forests such as creek flats and river valleys. Preferred habitat not present on site.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Erythrotriorchis radiates</i> , red goshawk (vulnerable)	Search for their characteristic nests in tall forest; soaring birds can also be spotted from elevated locations. Area searches (80h 10d)	Dawn and dusk observation (including call IDs) opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights Habitat searches (59.5 hours), plus 15 hours traversing waterway & floodplain and searching other clumps of trees. Total: 91 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened birds	Habitat throughout the project is highly disturbed, with a lack of permanent water bodies and very little area of forest or woodland. Species prefers mosaic landscapes with a large population of prey (birds) and permanent water, and open forest to allow for fast attacks and manoeuvring in-flight.
<i>Geophaps scripta scripta</i> , squatter pigeon (vulnerable)	Surveys in grassy understories near permanent water. Area searches or transect surveys (15h 3d), Flushing surveys (10h 3d)	Dawn and dusk observation (incl. call IDs), opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights. Total: 16.5 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened birds	Species prefers open forests to sparse, open woodlands. Forages in well drained, gravelly, sandy and loamy soils that support open forest to woodland communities. While grasslands with surrounding woodlands were observed in the vicinity of the project, the species has not been recorded during the surveys completed over past 13 years.
<i>Rostratula australis</i> / <i>Rostratula benghalensis</i> (<i>sensu lato</i>), Australian painted snipe/painted snipe (vulnerable)	Surveys through suitable wetlands at dawn and dusk (spotlighting shortly after dusk may detect birds). Targeted stationary observations (10h 5d), Land-based area searches or line transects (10h 3d)	Dawn and dusk observation (incl. call IDs) opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights. 12 hours over 3 days traversing waterway & flushing patches of appropriate habitat. Total: 28.5 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened birds	Favours shallow fresh waterbodies inundated or waterlogged grasslands. Sites usually include rank emergent tussocks of grass sedges and rushes Not found in areas of poor quality vegetation along Lagoon Creek.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Turnix melanogaster</i> , black-breasted button-quail (vulnerable)	Searches of suitable habitat (forested areas). Land-based area searches (15h 3d)	Dawn and dusk observation (incl. call IDs) opportunistic observations and spotlighting (4hours/night) 30 min bird counts across three sites for three nights. 30-60 min searches by 2 ecologists on 8 days. Total: 32.5 hours	1998, 1999 (stage 2) 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened birds	Prefers vine thickets and rainforests that are periodically water-stressed. Not present in very small area of isolated semi-evergreen vine thicket located on eastern edge of in the project site.

Type: Fish (1)

<i>Maccullochella peelii</i> , Murray cod (vulnerable)	Snorkelling, lure fishing and Electrofishing within suitable habitats. Fish more active at dawn/dusk/night during spring and summer. Electrofishing most successful during the day in areas of low turbidity. water that is at least 5 metres deep with high amounts of in stream wood, overhanging vegetation close to banks and have slow water velocities	Not surveyed due to unsuitable conditions onsite.		Cwlth DE Survey guidelines for Australia's threatened fish	Water bodies located within the project site are small isolated lagoons. Lagoon Creek is ephemeral, and does not provide suitable habitat and pools for the species.
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Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
Type: Mammals (5)					
<i>Dasyurus hallucatus</i> , northern quoll (endangered)	Baited cage and Elliot trapping between May and August to avoid breeding (in QUEENSLAND, for three consecutive nights). Optional: habitat searches, remote cameras, hair tubes, scat searches and spotlight surveys. Community liaison for additional records.	396 trap nights, 14 hours spotlighting	Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened mammals	Habitat preference for this species is a range of dry sclerophyll and vine thicket habitats with a strong association with rocky areas. Females have the higher preference for rocky areas.
<i>Chalinolobus dwyeri</i> , large-eared pied bat, large pied bat (vulnerable)	Anabat with optional harp trapping	Anabat. Spotlighting (4hours/night) Anabats at four sites for three nights, Spotlighting, 2 hours/night for a total of 16 h. 16 trap nights, 6 hours passive bat detection, 6 hours active bat detection Total: 40 hours plus 16 trap nights	1998, 1999 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened bats	This species is highly dependent on sandstone caves for roosting, which do not occur in the project site. Hollow roosting sites available in the project site may only provide opportunistic habitat if the species was in the area.
<i>Nyctophilus corbeni</i> , south-eastern long-eared bat (vulnerable)	Anabat followed by an appropriate level of trapping. Harp traps in forested areas below tree canopy and near open water bodies(20 trap nights, 5 nights), Mistnets (20 trap nights, 5 nights)	Anabat. Spotlighting (4hours/night) Anabats at four sites for three nights, Spotlighting, 2 hours/night for a total of 16 hours. 16 Trap nights. Total: 28 hours plus 16 trap nights	1998, 1999 26 Feb–2 Mar 2007 Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened bats	The project area lacks suitable habitat for this species. There are no patches of vegetation with a distinct canopy and a dense cluttered shrub layer.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Petrogale penicillata</i> , brush-tailed rock-wallaby (vulnerable)	Daytime searches for habitat resources and signs of activity (tracks, scats, etc.). Baited camera traps may be used. Observation of individuals.	Not surveyed due to absence of suitable habitat (confirmed during site searches)		Cwlth DE Survey guidelines for Australia's threatened mammals	Preferred habitat is large tumbling boulders and cliff faces to provide suitable refuge from predators. No such habitat onsite.
<i>Potorous tridactylus</i> , long-nosed potoroo (SE mainland) (vulnerable)	Daytime searches for habitat, scats and signs of activity. Soil plot surveys and baited camera traps. Intergrated approach required with both direct (trapping, hair sampling, etc.) methods and signs of activity.	436 trap nights, 14 hours spotlighting.	Oct–Nov 2013	Cwlth DE Survey guidelines for Australia's threatened mammals	Prefers dense understorey vegetation such as coastal heathlands and sclerophyll forests, with dense ground cover. Also prefers sandy soils where it is able to dig for food resources (fungi). The area supports high numbers of foxes and cats, which prey on this species and have contributed to its decline.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
Type: Reptiles (6)					
<i>Tympanocryptis pinguicollis</i> , grassland earless dragon (endangered)	Pitfall trapping.	Spotlighting (4hours/night), active searches. Ten sites with 1 hr or both diurnal and nocturnal survey effort per site (20h total per site). Twelve active search plots (total of 6h search effort). Pitfall trapping (5 buckets linked by drift fence for 4 nights - total of 60 bucket nights). Nocturnal and diurnal surveys. Active searching. Two hours targeted species searches in grasslands. Pitfall traps 20 pit traps at three sites with drift fences, 60 trap nights. Spotlighting, 2 hours/night for a total of 16 hours. Total: 48 hours including 120 trap nights	1998, 1999 (stage 2) 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened reptiles	Occurs in naturally treeless native tussock grassland on black or brown clay loams. It prefers ungrazed or lightly grazed paddocks with a slight slope dominated by wallaby grasses, spear grasses, tussocks grasses and kangaroo grasses. The species are known to shelter under rocks and sometimes in insect holes. The species has been collected from Brookstead, Pittsworth and Toowoomba. Not present in grasslands within the site.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Anomalopus mackayi</i> , five-clawed wormskink, long-legged wormskink (vulnerable)	Active searching and pitfall traps during wet periods. Artificial shelter (hay bale) sites.	Spotlighting (4hours/night), active searches Ten sites with 1 hr or both diurnal and nocturnal survey effort per site (20h total per site). Pitfall trapping (5 buckets linked by drift fence for 4 nights - total of 60 bucket nights). Nocturnal and diurnal surveys. Active searching. Pitfall traps 20 pit traps at three sites with drift fences, 60 trap nights. Spotlighting, 2 hours/night for a total of 16 hours. 16 hours active search Total: 48 hours including 120 trap nights	1998, 1999 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb-2 Mar 2007 Oct–Nov 2013	Cwlth DE Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles	This species occurs in woodland and grasslands, including bluegrass grasslands, poplar box and brigalow communities. In modified areas, the species has been found sheltering under sheet metal, timber and hay bales. Not present in blue-grass, poplar box and brigalow communities within the site.
<i>Delma torquate</i> , collared delma (vulnerable)	Turning rocks and raking litter in appropriate habitats (woodland sites with grassy understorey) most effective (pitfall trapping not very effective).	Spotlighting (4hours/night), active searches Ten sites with 1 hr or both diurnal and nocturnal survey effort per site (20h total per site). Pitfall trapping (5 buckets linked by drift fence for 4 nights - total of 60 bucket nights). Nocturnal and diurnal surveys. Active searching. Pitfall traps 20 pit traps at three sites with drift fences, 60 trap nights. Spotlighting, 2 hr/night for a total of 16 hours. Total: 48 hours including 120 trap nights	1998, 1999 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened reptiles, Cwlth DE Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles	This species is found in poplar box, lemon-scented gum and ironbark forests on stony soils and rocky ridges in southern Queensland. These communities usually have an understorey of grasses and lantana that produce thick leaf litter. The species seeks the protection of fallen timber and stones. Not present in potentially suitable habitat in poplar box and brigalow communities, or in Eucalypt communities along rocky ridge lines that have been surveyed.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Egernia rugosa</i> , yakka skink (vulnerable)	Elliot trapping next to suspected burrows or active searching (early morning and late afternoon), searching for burrow systems. Spotlighting (1.5hours/ha, 3+ nights). Possibly more active in late spring and summer.	Elliot trapping c. 10m apart for a min. of two consecutive nights. 375 trap nights in total. Spotlighting (4hours/night), active searches Ten sites with 1 hour or both diurnal and nocturnal survey effort per site (20 hours total per site). Pitfall trapping (5 buckets linked by drift fence for 4 nights - total of 60 bucket nights). Elliot trapping 25 baited traps for three nights, total trapping of 300 trap nights. Nocturnal and diurnal surveys. Active searching. Pitfall traps 20 pit traps at three sites with drift fences, 60 trap nights. Spotlighting, 2 hours/night for a total of 16 hours. 16 hours active search, 80 trap nights, 14 hours spotlighting. Total: 48 hours, with 375 trap nights	1998, 1999 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb–2 Mar 2007 Oct – Nov 2013	Cwlth DE Survey guidelines for Australia's threatened reptiles, Cwlth DE Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles	The species is known to occur in brigalow communities, as well as poplar box woodlands. The species has been found in cavities around buried rocks stumps and logs, it also seeks refuge in hollow logs and to burrow tunnels. In cleared areas, the species is known to find shelter under log piles, erosion gullies and rabbit warrens. Not present onsite: no burrow systems or latrine sites have been identified.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Furina dunmali</i> , Dunmall's snake (vulnerable)	None known to reliably detect the species. Recommended methods include active searching, pitfall trapping, road driving at night, spotlighting (1.5hours/ha, 3+ nights) (all methods likely to yield low returns).	Spotlighting (4hours/night), active searches Ten sites with 1 hr or both diurnal and nocturnal survey effort per site (20h total per site). Pitfall trapping (5 buckets linked by drift fence for 4 nights). Two hours of road and track based survey for four nights. Nocturnal and diurnal surveys. Active searching. Pitfall traps 20 pit traps at three sites with drift fences, 60 trap nights. Spotlighting, 2 hours/night for a total of 16 hours. Total: 48 hours including 120 trap nights	1998, 1999 (stage 2) 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb–2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened reptiles, Cwlth DE Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles	This species is very rare and furtive. There are few records of its occurrence. It has been recorded in brigalow, cypress pine and sheoak communities, on black alluvial cracking soils. The species has been found sheltering under fallen timber and ground litter, it could make use of cracks in clay soils. Not present at site in brigalow communities.
<i>Paradelma orientalis</i> , brigalow scaly-foot (vulnerable)	Opportunistic searches under rocks, logs, leaf litter, etc. Nocturnal searches of feeding locations (1.5/ha, 3+ nights). Drift fence and funnel traps are also useful. Pitfall trapping.	Spotlighting (4hours/night), active searches Ten sites with 1 hr or both diurnal and nocturnal survey effort per site (20h total per site). Pitfall trapping (5 buckets linked by drift fence for 4 nights - total of 60 bucket nights). Nocturnal and diurnal surveys. Active searching. Spotlighting, 2 hours/night for a total of 16 hours. Total: 48 hours including 60 trap nights	1998, 1999 (stage 2) 9–14 Feb 2007 (targeted stage 2 survey) 26 Feb – 2 Mar 2007	Cwlth DE Survey guidelines for Australia's threatened reptiles, Cwlth DE Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles	This species has been recorded in a variety of open woodland communities and soils types. Specific habitat preferred by the species, relevant to the site includes brigalow/belah open forest and mountain coolibah open woodland. Its preferred micro habitat includes sandstone slabs, logs, fallen bark, leaf litter and grass tussocks. The species is known to be able to persist in areas that have been cleared and disturbed. Not present in preferred habitat of brigalow/belah open forest and mountain coolibah open woodland recorded within the site.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
Type: Flora (8)					
<i>Lepidium peregrinum</i> , wandering pepper-cress (endangered)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail line)		This species was thought to be extinct until recently rediscovered in near Clifton in northern New South Wales. Was found in open riparian forest growing in sandy alluvium. No suitable sandy soils observed within the project site.
<i>Streblus pendulinus</i> , Siah's backbone, isaac wood (endangered)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail spur)		This species grows mainly along watercourses in well developed rainforest, gallery forest or drier rainforests. No suitable habitat recorded within the project site.
<i>Cadellia pentastylis</i> , ooline (vulnerable)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail spur)		Occurs in dry rainforest, semi-evergreen vine thickets and dry sclerophyll communities. Preferred habitat is not present or in a very degraded condition within the site.
<i>Clematis fawcettii</i> , stream clematis (vulnerable)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail spur)		Not present – the only semi-evergreen vine thicket does not occur near a stream.

Name	Survey approach guide	Total survey effort	Timing	Survey guidelines	Notes on species absence
<i>Haloragis exalata</i> subsp. <i>Velutina</i> , tall velvet sea-berry (vulnerable)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail spur)		This species occurs in rainforest and rainforest margins, including dry rainforests. It is often found in damp areas near watercourses. Nearest record is from the Bunya Mountains. No suitable habitat at the site.
<i>Sarcochilus weinthalii</i> , blotched sarcochilus, weinthals sarcanth (vulnerable)	Random meander techniques	Vegetation types in study area inspected and species lists compiled.	Aug 2005 (stage 2) 26 Feb–2 Mar 2007 20 Nov 2008 (traverse of haul road, in proximity to newly proposed rail spur)		Found growing in trees of rainforests and dry scrubs. No suitable habitat recorded within the site.

Coordinator-General's conclusion regarding MNES species unlikely to be present on-site

In assessing that the above flora and fauna species of conservation significance are not likely to be present on-site, the proponent considered species habitat preferences, known distribution, previous records from the region, occurrence of habitat in the study area, characteristics of the remaining vegetation in the area, presence of predators, and field observations.

The surveys were informed by various Commonwealth survey guidelines for threatened birds, brigalow belt reptiles, fish, mammals, reptiles; and threatened species listing advices.

I note that, as described in Table 8.5, the brush-tailed rock-wallaby (*Petrogale penicillata*) and Murray cod (*Maccullochella peelii*) were not surveyed due to the lack of suitable habitat found on site.

The survey efforts undertaken for the existing operation provided an understanding of site conditions and a collection of data to inform surveys undertaken for the proposed stage 3, and add weight to the conclusion that the species indicated in Table 8.5 are unlikely to be present on site or depend on the site for habitat.

I further note that surveys undertaken for the project occurred over a range of seasons and conditions, and that the October to November 2013 fauna survey effort targeted particular threatened species including those advised by DE officers earlier in the year. This survey event also served to update information obtained in prior surveys that were undertaken during a period of extended drought.

The later survey also targeted different search approaches for birds, including flushing within grasses, searching for nests, and targeted surveys of flowering nectar resources, including eucalypts.

I note that opportunistic sightings for flora species were also allowed for in the scope of the 2013 fauna surveys.

I am of the view that these factors, along with consideration that no sightings of the species were confirmed, and, for fauna, no evidence of the species' use of the site was found during any of the numerous site surveys, supports the view that these species are unlikely to occur on site.

8.3 Water resources

8.3.1 Surface water

The project is located in the Lagoon Creek catchment, which has an area of around 200km². Lagoon Creek bisects the project site from north-east to south-west, and flows southwards towards Jondaryan and into Oakey Creek. Lagoon Creek's headwaters are located 6km north-east of the project site.

The Oakey Creek catchment is a component of the Condamine River catchment, which covers an area of 87,300km². The Condamine River catchment is part of the

Condamine-Balonne Basin, which in turn, is part of the Murray Darling Basin catchment.

The project lies immediately south of the Myall Creek catchment. Spring Creek, located 2.5km north of the project site, is the closest tributary of Myall Creek. A gully from Spring Creek extends down on to the existing mine site. The existing mine has an authority to discharge into the tributary on the rare occasion that flow conditions are suitable.

The region has been subject to hydrological and ecological modification primarily for agricultural purposes. The installation of weirs and dams, the extraction of surface and groundwater for agriculture, along with clearing for cropping and grazing has altered its condition.

Lagoon Creek is an ephemeral creek that only achieves full stream flow due to run-off following high rainfall conditions. Sections of the creek are frequently dry, while others feature isolated pools. In-stream farm dams impact on low flows and connectivity. The main channel of Lagoon Creek is shallow, small and poorly defined, with significant erosion in places along its banks. The creek features a large floodplain which conveys significant volumes during major flow events.

Riparian trees have been extensively cleared; however, some of the north-eastern areas on the project site have relatively intact riparian vegetation, including both trees and shrubs. Downstream at the south-west section of the creek, where the rail spur is proposed to be located, riparian vegetation has been cleared and grasses dominate. Ploughing over the creek banks and bed has occurred, smoothing out its profile.

No diversion of the creek is proposed by the project; instead, mine pits will be excluded from within 150m of the creek, with a 50m conservation zone to be applied either side of the creek for its extent across the MLA. Replanting will be undertaken in the conservation zone which will work to improve the riparian values across the project area. I have set conditions regarding this improvement in my report.

Historical rainfall records indicate average ranges from around 85mm in January to a low of 30mm in August, with a yearly average of 640mm. Pan evaporation well exceeds average rainfall for every month, with a peak of around 175mm in January and just under 60mm in June. Bureau of Meteorology estimates indicated aerial actual evapotranspiration for the region to be between 600–700mm per year.

8.3.2 Groundwater

Geology

The site is within the Cecil Plains sub-basin, located in the western area of the Clarence-Moreton Basin. The Clarence-Moreton Basin is an eastern component of the Mesozoic Great Artesian Basin (GAB). Figure 6-1 of the EIS (Chapter 6) confirms the surface geology of the area.

Hydrogeology

The five aquifers present at the site in order from shallowest to deepest are:

- Quaternary Alluvial
- Tertiary Basalt
- Walloon Coal Measures (WCM)
- Marburg Sandstone; and
- Helidon Sandstone.

Of these, the WCM, Marburg Sandstone and Helidon Sandstone are sub-artesian aquifers within the Eastern Downs Management Area under the Great Artesian Basin (GAB) Water Plan. The Marburg Sandstone and Helidon Sandstone aquifers are regarded as major GAB aquifers.

A conceptual model of the hydrogeological conditions at the site, which indicates the aquifers and location of the water table relative to the pits, is included at Figure 3-1 Appendix F IESC Report, AEIS.

Quaternary Alluvial (alluvial aquifer)

Quaternary deposits of alluvium from creeks feature to the west, south and east surrounding the project site. Major alluvium deposits are associated in the south with Oakey Creek and Doctors Creek. To the north of the site there are widespread alluvium deposits associated with Myall Creek.

For the project site, there is a minor occurrence of shallow alluvium located to the south-west which is associated with Lagoon Creek.

Alluvial resources in the area are part of the Upper Condamine Alluvium—Tributaries SDL Area under the Commonwealth *Water Act 2007—Basin Plan 2012*, which regulates use of the resource to balance community, industry and environmental water needs. The Plan's Sustainable Diversion Limits (SDL) will regulate the annual long-term take from the SDL Area. SDLs will come into effect in 2019.

The Commonwealth Basin Plan identifies that this SDL area is over its SDL volume limit and is subject to 'buy back' measures in order to restore annual volumetric take to the required SDL volume minimum. Therefore, any additional take, including from drawdown of groundwater, will trigger the Basin Plan requirement that identifies any third-party impact on this resource which will need to be addressed.

Tertiary Basalt

The more recently formed Tertiary Basalt aquifer, which, similar to the WCM, is shallow at site, is mostly evident in the north-west of the project area. It varies in thickness from 1–90m. The Manning Vale West pit may intersect this aquifer to a degree.

Permeability within this aquifer consists of both primary and secondary porosity, with the latter anticipated to be the dominant influence.

The more recently formed Tertiary Basalts overlay the WCM at some areas of the project site. In some locations within the mining lease, due to preferential weathering of the softer WCM it is likely that the base of the Tertiary Basalt would sit below the upper edge of the older WCM.

The Tertiary Basalt is a component of the Main Range Volcanics aquifer system. The Main Range Volcanics is part of the Condamine Basalts Sustainable Diversion Limit (SDL) Area under the Commonwealth *Water Act 2007—Basin Plan 2012*. As with the alluvial aquifer system, SDLs will come into effect in 2019.

The Basin Plan identifies that this SDL Area is also at its SDL volume limit. Therefore, as with the alluvial aquifer, any additional take will trigger the Basin Plan requirement that any third party impact on this resource will need to be addressed.

Walloon Coal Measures

The WCM is the main aquifer that will be affected by the project. Mine pits will be excavated below the water table, with pit-dewatering to be undertaken to ensure workable mining conditions. In-pit discharge from aquifers will also occur over the long-term, post mining. In-pit filling and profiling will occur post mining, with around two thirds of mine voids rehabilitated to around former surface levels, and so will be above the water table. However, 3 voids totalling around 457ha will remain.

The WCM is around 120–130m thick across the majority of the project site. The depth of the mine pits will extend to around 75m below ground level.

The three major coal intervals within the lower WCM are the Waipanna, Acland-Sabine, and Balgowan. The mine extracts from the Acland-Sabine interval.

The WCM mostly consist of low permeable sediments, with the more permeable coal seams better equipped to store and transmit water. Short-term pumping indicated that the coal seams behave as separate aquifers; however, the EIS assumes the WCM would behave as one system when subject to dewatering stress from mining.

Pumping tests indicated that groundwater in the WCM system ranges from semi-confined at its upper layers to confined in the lower areas. Assessments of the WCM's storativity properties found differing results across the strata depths which led to the conclusion that the deeper layers largely act as confined aquifers.

The EIS found that the presence of low permeable mudstones and siltstones between the coal seams, with the lower level of the WCM featuring fine-grained sediments such as siltstones, fine sandstones and mudstones, influences the characteristics of the system's groundwater layers.

Marburg Sandstone

The Marburg Sandstone, with an estimated thickness of between 200–300m at the project site, is a deeper aquifer that underlies the WCM. The base of the mine pit will be around 75m above the top of the Marburg Sandstone.

The EIS stated that the aquifer is confined by the low-permeable base of the WCM and below it, by the relatively impermeable Evergreen Formation, which is around 200m thick at the project area.

Recharge to the Marburg Sandstone is likely to occur at an outcrop of the formation to the north-east of the project site, with discharge via groundwater bores and through-flow to the south west.

Helidon Sandstone

The EIS found that the Helidon Sandstone aquifer is up to 170m thick at the project site and is confined by the Evergreen Formation and the deeper Texas Beds. This system occurs at depths of between 500–600m at the project site.

The formation outcrops in the north-east of the wider project area, which is where recharge from surface water flows and rainfall is received.

Discharge from the Helidon aquifer occurs mainly from groundwater bores and from the formation's flow to the south west.

Surface water to groundwater interaction

In re-running the groundwater modelling for the AEIS, boundary conditions were updated with improved inputs such as LiDAR readings to better understand water table conditions and surface and groundwater interactions.

The AEIS found that significant surface water and groundwater interaction is unlikely for the WCM aquifer. WCM groundwater levels at the project site range from around 6–55mBGL. Groundwater has not been identified as contributing to surface water flows within nearby creeks and streams.

Groundwater levels within the Oakey Creek alluvium to the south of the project site are known to be below the base of the stream channel. The EIS therefore found that the likelihood of impacts on ecosystems is considered low.

Groundwater assessments

Key documents of the EIS that evaluated the potential impacts due to mining on groundwater quality, quantity and availability that were considered in the assessment of the project include:

- Chapter 6: Groundwater resources
- Appendix G4.1: Aquifer testing report
- Appendix G4.2: Landholder bore survey results
- Appendix G4.3: WSA water quality lab reports
- Appendix G4.4: Stage 3 groundwater quality laboratory reports
- Appendix G4.5: Groundwater numerical modelling report
- Appendix H.2: IESC submission
- Appendix J.5: Groundwater monitoring and impact management plan
- Appendix J.19: Environmental management plan.

The AEIS provided updated information about potential impacts. Key AEIS documents on groundwater that have been considered in this assessment include:

- Appendix F: IESC Report: updated the EIS's groundwater numerical modelling (Appendix G4.5) in response to advice received from the IESC. Includes an independent contractor's peer review report of the updated modelling.

- Appendix G: Additional Landholder Bore Survey: as a result of the revised numerical modelling, 19 additional potentially impacted bores across 13 lots were identified, with 14 able to be surveyed.
- Appendix H: Revised Groundwater Monitoring and Impact Management Plan: updated due to results of the revised modelling (supersedes Appendix J.5, EIS) and following advice from DNRM.
- Appendix N: IESC Submission Response: this document responded to the April 2014 advice from the IESC about the project
- Appendix C: Revised Environmental Management Plan
- Chapter 5.1: Key issues requiring further clarification
- Chapter 5.2: Response to advisory agency submissions.

Note that as the groundwater model was modified following advice received from the IESC, modelling results as presented in Chapter 6 of the EIS have been superseded by modelling results and interpretations as described in the AEIS.

8.4 Monitoring and modelling of water resources

8.4.1 Surface water

Key documents of the EIS and AEIS that discussed monitoring and modelling approaches undertaken for surface water matters such as surface water quality, surface hydrology (pre and post-project), water availability, resource impacts and the interaction of surface water with groundwater systems included:

- Chapter 5 – Surface water resources, particularly:
 - section 5.6: Existing water quality values and water quality sampling methods
 - section 5.7: potential impacts on water quality
 - section 5.10: Existing flooding characteristics, including modelled area, design parameters, boundary conditions and model verification
 - sections 5.9, 5.10 and 5.11: considered the existing flood hydrology, modelled pre-and post-mine operation and final land form post-mine flooding characteristics and impacts
 - section 5.13: water balance modelling: discusses future water requirements and sources, including from surface water run-off and rainfall
- Chapter 8 – Aquatic ecology, which described environmental values in the creek
- Appendix G.3.1 Water quality data, obtained from sampling at the project area
- Appendix H.2: IESC submission, which considered the relationship between surface water and groundwater systems
- Appendix J.4: Water Resources Management Plan, which addresses background water quality, surface water quality monitoring, discharge impacts, mine water release conditions, taking into account limits for the protection of the environment and resources; and associated management strategies.

In addition, the AEIS included information in response to advisory agency and public submissions about surface water matters, such as water quality, availability and flooding. Key chapters included:

- Chapter 5.1 Key issues requiring further clarification
- Chapter 5.2 Advisory Agency responses
- Chapter 5.3 Submitter Responses
- Revised Environmental Management Plan
- Appendix N: IESC Submission Response which included further consideration of the surface water to groundwater interaction
- Appendix G: Landholder bores survey report, which updated surveyed bores as a result of remodelling of groundwater undertaken post-EIS.

Existing water quality

As an ephemeral creek that is largely a chain of ponds in an area that receives irregular rainfall events, the water quality of Lagoon Creek is variable. Due in part to the small catchment area, flow events are typically intense and relatively short.

Flows result in large sediment loads entering the creek, particularly when preceded by a long absence of rainfall.

Lagoon Creek does not contain a state government regional water quality gauge, with the nearest one located around 38km from the project site in Oakey Creek at Fairview, downstream of the confluence with Lagoon Creek. This gauge is also downstream of towns and agricultural areas and so monitoring results are unlikely to be closely representative of conditions in Lagoon Creek.

Some limited Lagoon Creek water quality data is however available from the existing mine's operation. Data obtained from monitoring undertaken between 2008 and 2013 as a requirement of the mine's existing EA informed the EIS's assessment of local conditions. Monitoring was taken at three sites: two located downstream of the mine, and one upstream.

The EIS's water quality assessment was also informed by two on-site sampling events, with one undertaken in January 2008 (during dry conditions) and the other during a flow event in March 2013. For the latter, four sample points were visited, with one located upstream of the mine.

Draft environmental values (EVs) for surface waters in the Condamine catchment were released in 2012. These have been used in the EIS to determine the environmental values for Lagoon Creek. Water quality objectives (WQOs) are used as the basis to protect an area's EVs and are further used to develop mine water release limits and establish a monitoring program for the receiving environment.

WQOs for the Condamine catchment have not been released; however, along with a suite of others across the state, are currently under development by the state government.

In determining water quality limits, the EIS considered WQOs for the adjacent Dawson River subcatchment. While these would not provide a best fit for the influence on localised conditions of aspects such as turbidity, parameters such as sodium concentration would tend towards being a general value.

In addition, relevant guidelines including the *Australian Water Quality Guidelines* (AWQG) (2008) were referred to in determining thresholds for the protection of aquatic ecosystems.

In consideration of the four levels of aquatic ecosystem health cited in EPP (Water), Lagoon Creek was defined in the EIS as a slightly to moderately disturbed aquatic ecosystem for the purposes of applying water quality guidelines and trigger values. This would produce a 95 per cent level of protection of species.

The following water quality observations were taken from analysis of data obtained from the monitoring events. Section 5.6.2 of the EIS contains the full data suite. Table 5.2–J Seasonal and Spatial Variation of Water Quality (AEIS) contains the comparative wet season and dry season data, compared to the WQO for Dawson River.

Electrical conductivity (EC) and pH

- EA monitoring (three sites): median pH and EC values were higher at the two sites downstream of the mine. pH exceeded the guideline levels of 6.5–7.5 at the two downstream sites (which both registered 7.8), and for EC, the guideline level of less than 500µs/cm was exceeded at one site (596µs/cm).
- 2013 (flow event) sampling: EC levels below guidelines level of 500µs/cm; pH slightly lower than long-term medians.
- 2008 sampling: EC levels (500µs/cm) were exceeded at four of five sites, ranging from 596.4 to 8 089.60µs/cm. This was for a no-flow scenario where standing pools were sampled.
- 2008 sampling: pH values were higher than the long-term medians, but were within the EA monitoring recorded ranges.
- Dissolved oxygen (DO) was within range at three of five sample points, ranging from 95.23–92.10 per cent compared to the guideline of 90–110 per cent; but was low at one point (65.61 per cent) and slightly higher than the guidelines (111.67 per cent) at the other.
- It is noted that the one-off sampling affords limited representation for both pH and DO, given it does not account for diurnal or seasonal fluctuations.
- 2013 sampling: DO ranged from 15 per cent to 51.8 per cent at four sites, which was well below the guideline level of 90–110 per cent. The reduced levels could be due to the decomposition of organic matter in run-off.

Nutrients, dissolved metals, toxicants

- 2013 sampling: nitrogen and phosphorus exceeded guidelines at all four sample sites. Total nitrogen ranged from 1.4 to 0.84 milligrams per litre (mg/L) compared to the guideline of less than 0.25mg/L. Total phosphorus ranged from 0.31mg/L to 0.12mg/L, compared with the guideline level of less than 0.030mg/L.

- 2013 sampling: ammonia was high upstream of the mine, at 0.35mg/L (guideline states less than 0.010mg/L) and was exceeded at the remaining three, ranging from 0.037 mg/L 0.061mg/L.
- The EIS stated that reduced levels at the three downstream sample points was due to a concentration of dissolved inorganic nitrogen being present, suggesting oxidation of the ammonia occurred at these sites.
- Total phosphorus tended to increase downstream, with it suggested this may be due to the greater catchment area facilitating mobilisation of phosphorus in soils.
- Dissolved concentrations of metals including chromium, manganese, and zinc were below guidelines, with the exception of copper which exceeded the guideline at one location.
- Pesticides and hydrocarbons were below detection limits at all sites.

The findings from the surface water quality monitoring program found that water quality was generally poor. Not unexpectedly, higher pH and EC occurred during the dry season, and high nutrient amounts were present during the wet season survey. The ammonia reading upstream of the mine could be toxic to fish. The low concentrations of DO during the flow event could also present a risk to fish species.

The data results were typical of an agricultural area. The high levels of nutrients in the 2013 flow event, such as inorganic nitrogen (nitrate and ammonia) and phosphorus are both found in fertilisers.

The inorganic nitrogen is caught up in surface water flows that enter the creek, while phosphorus, which is captured in the soil, enters the water as a result of erosion from rainfall or flow events.

Flood modelling

The topography of the area in the upper reaches of the creek at the project boundary is in the order of 450m Australian Height Datum (AHD). The land gradually slopes to around 406m AHD at the proposed location of the rail loop at the northern end of the proposed rail spur, which will extend 8km south to the existing West Moreton rail line north of Jondaryan. At Jondaryan, the AHD is around 384m.

The hydrological modelling for the project's analysis of surface water flows considered existing conditions and developed project assumptions. XP-RAFTS software was used to understand catchment flow, and used inputs such as rainfall patterns, depths, and physical catchment characteristics. The Lagoon Creek catchment was broken down into 17 sub-catchments within the model profile.

As there was no historical gauging for the catchment, parameters used in the model to understand its response to rainfall were adopted from regional averages. These were adjusted to provide peak flows that were consistent with those from the regional flood frequency analysis.

The hydraulic model area of the model extended from Lagoon Creek about 400m outside the mining lease area, north-east of the project site, and then concluded

downstream south of the Warrego Highway, including the town of Jondaryan in its extent. TRUFLOW hydraulic model software was used.

The hydraulic model included the Spring Creek gully, which crosses the project area near the proposed rail spur and balloon loop. The model considered various scenarios up to the Probable Maximum Flood (PMF) extent.

Figure 5-10 of the EIS shows the extent of the hydrological and hydraulic model domains. Sections 5.9 and 5.10 of the EIS described the methodology and inputs that informed the hydrological and hydraulic modelling of the project area, the design parameters, rainfall assumptions, boundary conditions and the process used for verification of results.

Modelling indicated that flow depths within the creek channel are typically in the order of 1–1.5m for the 1 in 10 Annual Exceedence Probability (AEP) and 1.5–2m for a 1-in-100 AEP flood event. Flow depths on the floodplain are typically less than 1m for the 1-in-100 AEP and less than 300mm for the 1-in-10 AEP.

Flow velocities across the project site vary, with flows of up to one metre per second (m/s) and 1.5m/s within the creek channel in the upper reaches of the project's mine area and 1.4m/s and 1.8m/s downstream near Jondaryan for the 1-in-10 AEP and 1-in-100 AEP respectively. Flow velocities on the floodplain are typically less than 1m/s for the 1-in-100 AEP.

Figure 5-12 to Figure 5-17 of the EIS presented the modelled Lagoon Creek flood depths and velocities for the pre-project scenario. The results confirm the widening nature of flood flows as they travel south across the site, with the majority of conveyance occurring in the floodplain.

8.4.2 Groundwater

Existing monitoring network

DNRM's registered bores list identifies 939 bores within an 8km radius of the project, with 827 categorised as existing (others are listed variously as either abandoned and destroyed; abandoned but useable; or proposed).

Of the existing registered bores, 441 (41 per cent) have a known aquifer source. Figure 6-4 of the EIS maps the bores by aquifer. Table 6-5 of the EIS confirms the numbers of bores accessing each aquifer. Table 6-6 presents groundwater quality, yield and standing water levels (SWLs) for around 100 of the bores.

For the existing mine, NAC monitors 15 bores in the WCM and Basalt aquifers for the purposes of reporting compliance to EHP. For these bores, Table 6-10 of the EIS provides the location identifier, its aquifer, the frequency of water quality monitoring (six-monthly) and frequency of groundwater levels monitoring (monthly). The table's notes confirm 19 analytes are considered within the water quality analysis.

In addition to these bores, NAC monitors groundwater levels at 10 other bores: 5 in the Marburg Sandstone; 1 in the Tertiary Basalt; 1 in the WCM; and 3 in the alluvials. Table 6-11 of the EIS provides details of these bores.

Figure 5-2, Appendix N, AEIS, shows the location of all bores used to inform the groundwater impact assessment for the project. Fourteen bores were installed for the project in 2007/2008 (13 in the WCM and 1 in the Tertiary Basalt). Some existing site bores were also used to inform the dataset, and are included in Figure 5-2.

Groundwater heads and quality of water by aquifer

Project area context

From the DNRM registered bores list, Table 6–6 (discussed above) confirms the following base-level information about groundwater hydraulic heads and water quality for each aquifer (for those bores where information was available), within the 8km radius:

- alluvial aquifers, largely located around the project boundary to the south and north-west SWL ranged from 8.53m below ground level (mBGL) to 33 mBGL. Quality is described in the DNRM database as ranging from salty to potable
- Tertiary Basalt: largely clustered to the west of the project site: SWL from 0.3–45 mBGL. Water quality largely described as potable, with some listed as brackish. Groundwater used for livestock and domestic use
- WCM: SWL from 2.7 to 103mBGL. Water quality ranges from potable to brackish and salty. Water mainly used for livestock
- Marburg Sandstone: SWL from 21 to 120mBGL. Potable quality, extracted for municipal supply and stock use
- Helidon Sandstone: 1 bore only; located adjacent to the town of Oakey. No SWL or quality data. Water extracted in the area for commercial/industrial purposes (e.g. an abattoir).

Project site data

Table 5.2, Appendix N, AEIS indicated water levels observed at 13 of 36 monitoring points for aquifers located at the project site which were used as targets in the steady state calibration, summarised here:

Tertiary Basalt: ranged from 424.5–439.5m AHD (data from 2 bores)

Upper WCM: ranged from 402.7–452m AHD (6 bores)

Marburg Sandstone: 414–419.8m AHD (5 bores).

Water quality

Table 6-13, Chapter 6, EIS, provides the physiochemical results from monitoring of 10 project site bores in 2007. The results indicate that pH was neutral in the WCM, ranging from 6.8 to 7.4.

EC at the WCM bores ranged from 2,260 to 10,340 μ S/cm, with a mean of 5,256 μ S/cm. Total Dissolved Solids (TDS) ranged from 1,240 to 6,610mg/L, with a mean of 3,208mg/L. Most results were within the ANZECC guidelines of 4,000mg/L for most livestock use.

All results of monitoring for the WCM were at the very least double the ADWQG drinking water limit of 600mg/L for TDS, confirming WCM water at the project site is generally brackish.

For the one Tertiary Basalt aquifer bore, TDS was found to be 330mg/L, well within the ADWQG limit, indicating the water was fresher than the WCM. EC was not recorded.

For monitoring undertaken as part of the existing operations, TDS in the Tertiary Basalt aquifer ranged from 800 to 3,000mg/L, which correlates to 1,300 to 4,500µS/cm for EC.

Table 6.14 of the EIS confirms results from major ion chemistry analysis undertaken at the WCM bores in 2007, with Arsenic, Lead, Zinc, Cadmium and other chemicals assessed. No exceedances of limits set by AWQDG for human consumption were recorded.

8.5 Potential impacts to water resources

8.5.1 Surface water

This section considers potential impacts to water resources from the project. Management and mitigation measures are considered separately in Section 8.6 (Management of water resources).

Flooding

Hydrodynamics

As the mine does not propose to redirect any creeks, potential impacts to the flow, depth and velocity from changes in the landscape largely come from the creation of structures on-site and discharges.

Newly proposed structures such as the flood levees parallel to the Manning Vale East pit and the Willeroo pit to Lagoon Creek; and the TLF and associated rail spur were assessed to understand what impacts to flow depths and velocities may occur.

Other structures will be extensions of existing facilities not located on the floodplain; or new structures, such as environmental dams, that will be built outside the floodplain.

Figures 5-12 to 5-17 of the EIS show flood modelling scenarios based on current conditions. Figures 5-20 to 5-30 show modelling scenarios with the project developed. Figure 3-6, Appendix C of the AEIS, shows the proposed water management structures for the project.

Flood levees

The mine pit flood levees will be built outside of the 1-in-10 AEP and so will have no impact during low flow events. The proponent has committed to build these structures to withstand a PMF event to ensure overtopping of floodwaters into the pits does not occur. The levees will each be 3.5m high and between 1.5–2km wide.

Modelling indicated that for a 1-in-1,000 AEP, an increase of around 0.5m in flood depth will occur at the levees. This reduces to pre-mine flow conditions within 3km of the mining lease boundary.

Only minimal changes to velocities are anticipated in high-flow scenarios. Therefore no changes outside of the project site are anticipated from the development of the flood levees.

Train load-out facility

The AEIS noted that the location proposed for the train load-out facility (TLF) in the EIS had been changed, with the facility moving around 350m to the west (refer to 3.1-A, AEIS). This is an improvement, as it will remove it from the flood area for all modelled scenarios.

Rail spur and balloon loop

The approximately eight km rail spur will be built on the floodplain, joining in the south with the existing West Moreton rail line in the vicinity of Jondaryan. In line with Aurizon standards, its construction will be built to a 1-in-100 AEP, with overtopping to occur in heavier events. Spur design parameters inputted into the modelling were based on a preliminary concept that included culverts and other structures that would ensure conveyance of flood flows.

For the 1-in-10 AEP scenario, the spur would result in increases of up to 0.3m in depth occurred upstream of the railway line, with the increase reducing to pre-development conditions within the MLA boundary.

Modelling for the 1-in-100 AEP indicated the point where the rail spur crosses Lagoon Creek would cause an increase in flow depth of around 1.2m, however this reduced to a zero increase within 500m.

The increase would result in an increased depth of around 150mm on about 0.5ha of a private landholder's paddock which would not have previously been inundated. This impact is estimated increase to 300mm in a 1-in-1,000 AEP.

Downstream of the railway line a decrease in flood levels of around 20mm is modelled due to attenuation from the spur. This would be accompanied by an increase in peak velocity to 1.5m/s, however this will be contained on land owned by the proponent.

Figure 5-1 of the EIS indicates modelling results for flood flows at Jondaryan due to the project. The graph confirms that due to attenuation, there will be a very slight change in the order of minutes from when floods reach the town.

The EIS finds the project's structures will not cause adverse impacts to Acland, which sits above the floodplain; or Jondaryan, which is located in the floodplain.

Doctors Creek, to the west of Oakey, is considered to have a separate flooding regime to Lagoon Creek as the highest point between Lagoon Creek and Doctors Creek near Jondaryan is 8m higher than Doctors Creek. The AEIS states the project will not impact on floodwaters experienced by the town of Oakey.

Water availability

During rainfall events the project will capture run off water from disturbed areas as well as direct rainfall into the project's dams, resulting, during short rainfall events, in a reduction of the Lagoon Creek catchment area and flows.

The project's surface water capture would reduce the 200km² catchment area by 8.7km². This equates to a maximum reduction in catchment area of 4.3 per cent (in around 2019, for a two year period) with an average of 3 per cent reduction for the life of the mine. The amount will vary due to the staging of mining activities and progressive rehabilitation occurring behind the active mine pits.

Modelling undertaken to understand the extent of the impact was informed by flow series data provided by DSITIA which is relevant to local conditions.

Spells analysis modelling was undertaken to understand the reduction in water availability, particularly to determine the effect on a licenced water user downstream of the mine. The analysis determined the number of flow events over a set threshold, the duration of the event, and the number of days (spells) between events.

The licence holder is permitted to take water when flows exceed either 0.1m³/s or 8.64ML/day. The analysis found that over a 116 year period, there were 1,103 occasions when flows were above this amount, or 2.6 per cent of total days.

With the project impacts considered, this reduced to 1,073 spell events, or 2.53 per cent of all days.

DNRM requested further information about this impact, and it was clarified by NAC that the analysis considered the project as impacting for the full period of the analysis (116 years) rather than the project's lifespan.

NAC recalculated the model by reducing the actual impact of the mine to a 20 year period. The modelling considered eleven different replicates of the flow series which allowed for climate variability. This analysis found that for the 50th percentile, the mean annual volume the water holder may receive was reduced by around 0.5 per cent. For a 75th percentile scenario, it was calculated the mean annual volume would reduce by around 0.8 per cent.

Mine water releases

To keep the on-site mine water storages balanced particularly during times of high flow, the project proposes to release mine affected water (MAW) to Lagoon Creek under controlled conditions from three new environmental dams.

To date, releases from the mine to waterways have been rare, with one controlled release in the past 10 years occurring in the 2011 wet season. For that event, 26ML was released.

New controlled releases of a maximum of up to 50ML in a 1-in-100 AEP event are proposed by NAC, however given acceptable flow conditions are rarely achieved in Lagoon Creek, releases will be infrequent. The mine water management system does not rely heavily on releases from the project to Lagoon Creek. The range of predicted

releases ranges from 20ML/year to 170ML/year (with the latter being a very wet scenario).

Water captured onsite from disturbed areas or sediment affected water is treated for reuse (e.g. dust suppression, coal processing) and is also depleted by evaporation.

The EIS finds that by ensuring water management structures are safely engineered and located away from floodplain areas, the risk of uncontrolled releases is considered low risk.

Residual voids: surface water impacts

Flood levees installed around the two pits nearest to the Lagoon Creek floodplain will be removed post-mining when the area is rehabilitated to its final landform.

Being potentially high in salts and metals, mine pit water could present a risk to water quality should overflow of pit water occur during rainfall events after mining ceases.

NAC has committed to rehabilitate the final landform so that any depressions or hills will be located outside the existing PMF flood extent (commitment 105, Appendix D, AEIS).

In addition, contour banks will be constructed after profiling of the final landform to control run off, Contour banks will be constructed after profiling of the final landform to control run off, minimising hydrological disturbance. The contour banks will be designed to control the run off from a 1 in 20 year event (commitment 72, Appendix D, AEIS).

Water tanks

Dust from mining operations, such as the removal and relocation of overburden, coal stockpiling and transportation, has the potential to infiltrate nearby residential water tanks with sediment and metals.

The EIS confirms sampling of five water tanks near the mine occurred in 2007 and 2009. Results of testing indicated water quality was within limits set in the ADWQG for metals.

All tanks exceeded guideline health limits for E.coli, likely due to the influence of bird/fauna droppings. One tank to the south of the mine exceeded guideline limits for colour, which is a limit set in consideration of aesthetic value rather than being health-related.

Waste, sediment and erosion

The handling, storage and disposal on-site of waste (including chemicals and effluent) carries high risks to possible pollution of surface water during rainfall or flow events, or through discharge into waterways.

Similarly, sediment and erosion controls are integral aspect of mine management in order to avoid the contamination of surface water or watercourse flows with water that has come into contact with exposed soils, coal or industrial areas. Scouring can also occur due to improper release of waters or channelling of excess flows.

8.5.2 Groundwater

Impacts to quality

Voids

Revised groundwater modelling presented in the AEIS confirmed that the three mine pits are expected to form pit lakes post-mining. The depths of pit lakes are estimated to be around 33m for the Manning Vale West pit; 18m in the Manning Vale East pit; and 22m in the Willeroo pit.

In terms of acid rock influences on water quality, the EIS finds it unlikely that water captured in the lakes would become acidic from the oxidisation of pyrites due to the neutralising effect of the largely alkaline sediments. NAC states the existing mine has had no occurrences of acid rock drainage.

The EIS found that the pit levels are such that they are expected to act as groundwater sinks with a permanent drawdown into the pit relative to the associated aquifer. As such, pooled water would not be expected to exchange back into the WCM and affect water quality.

However, in the event of large rainfall events topping up the voids, occasional recharge from the lakes may occur.

Further information was requested by IESC and EHP on the likely impacts of pit water to groundwater quality. The AEIS states that analytical salt balance modelling found that the depressed landform lakes are not expected to become salinised within the 300 year modelling period due to the effects of long term incidental rainfall and surface water run-off into the pits.

The highest predicted lake salinity relates to the lake for the Manning Vale West pit, with a predicted lake salinity of around 2,100mg/L compared to an average of around 4,100mg/L for groundwater in the WCM.

Given this, a density contrast between the lakes and native groundwater that might overcome the generally inwards evaporation-driven hydraulic gradient between the depressed landform lakes and the surrounding WCM aquifer is not expected to occur.

Overall groundwater flow will continue to be towards the voids in the long term, and therefore the AEIS finds no impact on groundwater quality in aquifers is expected from the project post-mining.

Waste

In-pit wastes present risks to water quality if not properly managed. Similarly, in-pit tailings cells will need to be appropriately engineered and decommissioned to ensure no impacts to groundwater quality occur.

Groundwater supply allocation

The project is not seeking additional water allocation for mine use.

The mine's main operational source of water is from fine tailings process water, supplemented by supply from the project's Wetalla Wastewater Pipeline. NAC has a contract with Toowoomba Regional Council (TRC) until 2055 to purchase up to 5 500 ML of class A+ recycled water, and pays for 3,000ML per year in a take or pay arrangement.

The following indicates the current mine's water allocation and use for each aquifer at site:

- Tertiary Basalt: allocation 160ML/year. Use: 11ML/year.
- WCM: allocation: 271ML/year. Use: 2.6ML/year.
- Marburg Sandstone: allocation: 271ML/year. Use: 10.5ML/year.
- Helidon Sandstone: allocation: 710ML/year. Use: 17.1ML/year.

In total, from an allocation of 1,412ML, in 2012 NAC used 41.2ML. Use of these amounts is expected to continue for the mine's expansion, with bore water to be largely used for staff and operational purposes.

In addition, brine water from the Oakey water treatment plant is occasionally used at the mine, with NAC holding a permit for supply up to 150ML/year. Supply from Oakey has not been received since 2012. This water is used in the closed-system CHPP processing, with process water being sent to the in-pit tailings dams.

Mine water use

The project's site water balance is indicated at table 6.4-A, Chapter 6: Errata, AEIS.

In summary, the project's water use is estimated to be 8,925ML/year. Of this, 4,460ML/year will be sourced from tailings storages. 1,170ML will come from water captured at site (groundwater inflows and rainfall/dirty water run-off). The remaining net water requirement of 3,295ML is able to be supplied from the Wetalla Wastewater pipeline.

Groundwater drawdown by aquifer: end of mining

Revised groundwater modelling presented in the AEIS found that during operations, in-pit groundwater inflows are estimated to peak at around 3.5ML/day (median case arrived at after generating and analysing 18 scenarios).

Figures 6-20 to 6-31 (Appendix F, AEIS) include maps that show median case modelling results for anticipated drawdown impacts for each of the aquifers across a range of years during operations, at the end of mining (2030), and post-mining (2330). Estimated drawdown impacts at the end of mining are summarised below.

Alluvial aquifer: Four locations may experience drawdown. Of these, two zones are located in the vicinity of the Manning Vale West pit; one zone is located under Lagoon Creek with a maximum drawdown of around 2m predicted. The 1m drawdown contour maximum width extends to around 3km in two locations.

For the 2030 scenario, estimated drawdown in the alluvium was not located within 5km of Myall or Oakey creeks, therefore no impacts on stream flow are anticipated;

including on conditions at a natural spring on Myall Creek to the north of the project site.

While modelling indicated alluvium under a section of Lagoon Creek could be impacted, the AEIS states testing in this area confirmed no alluvium groundwater was present. In addition, the absence of registered bores in the vicinity supports the view that this location is unproductive and frequently dry.

The AEIS finds modelled predictions of drawdown at this location may be related to conservative calculations applied in establishment of the model parameters.

Tertiary Basalt aquifer: predicted drawdown is estimated to occur at nine locations, with four locations experiencing maximum drawdown impacts ranging from 1 to 2m. Four areas in the Tertiary Basalt aquifer outside of the project site indicate maximum drawdown of up to 5m.

The largest drawdown zone at the 1m contour is approximately 9km wide. At this location, a maximum drawdown of 2m is predicted to occur.

The maximum estimated drawdown for the Tertiary Basalt is predicted to be up to 12m.

WCM aquifer: a maximum drawdown of 47m is estimated to occur at the site near the pits. The 1m drawdown contour is estimated to extend over an area of around 21km in diameter. While the deepest drawdown areas are largely within the project site, drawdowns of 10m are estimated to extend around 3km offsite to the west of the project site.

Marburg Sandstone aquifer: a drawdown maximum of 12m is predicted, extending across a cone around 7km wide. This impact is largely contained within the mining lease area. The 1m drawdown contour is estimated to extend across an area of around 23km in diameter.

Residual impacts

Recovery of groundwater levels in the voids is predicted to be relatively rapid during the first few years post-mining, and stabilise to residual drawdown levels of between 2 to 6m.

Figure 6-1, Appendix F, AEIS, indicates that groundwater inflows to the voids are estimated to stabilise around 2085.

Due to the high evapotranspiration rate in the project area, groundwater discharge to the pit lakes is predicted to continue at a combined rate of around 1ML/day in the long term (median modelled case). It is anticipated that losses will occasionally be alleviated or paused by high rainfall events.

The long term post-mining scenario was modelled as 300 years after mining ceases. This figure allows sufficient time for the pit lakes to reach equilibrium (generally within 200 years). Given uncertainties regarding future climate trends, uniform climatic assumptions were incorporated into the model to understand possible system inputs.

Modelled long term drawdown impacts for each aquifer are estimated to be:

Alluvial aquifer: Figure 6-21, Appendix F, AEIS, shows no long-term impact on the Alluvial aquifer system is expected.

Tertiary Basalt aquifer: Figure 6-24, Appendix F, AEIS shows five impact areas in this system are predicted to persist post-mining. Four locations are expected to have a maximum drawdown not exceeding 1m. The largest zone, at a width of around 2km at its 1m contour, may experience a maximum drawdown of around 2m.

The AEIS finds that the pit lake water levels are not predicted to rise above the base elevation of the basalt aquifer, and so the pits are not anticipated to recharge into the basalt system.

WCM: Figure 6-28, Appendix F, AEIS, indicates three drawdown zones for the WCM aquifer in the vicinity of each pit are predicted to remain post-mining. A drawdown maximum of around 10m extending across an approximately 5km diameter contour near the Manning Vale West pit is predicted. Most of the maximum drawdown zone is located on the project site.

Smaller impact zones are predicted for the other two voids, with drawdown from 1 to 2m estimated across contours of around 3 to 4 km wide. The 1m drawdown extent is expected to prevail around 6km from the project boundary at its greatest extent (near the Manning Vale West pit).

Marburg Sandstone aquifer: Figure 6-31 (AEIS, Appendix F) confirms the predicted extent of drawdown for the Marburg aquifer long term is not expected to exceed 1m from an oval contour of around 3-4 km in diameter, located near the Manning Vale West pit.

Affected landholders: bores

There are 857 bores registered with DNRM within an 8km radius of the project site. Bores are used variously for domestic, stock and irrigation uses.

As a result of groundwater impacts modelling undertaken for the AEIS, NAC undertook additional landholder bore surveys (Appendix G, AEIS) and updated the impact profile for private bores.

In summary, affected bores equate to:

- (1) 77 bores registered with DNRM with a known source aquifer, namely:
 - (a) Tertiary Basalt: 17 (comprised of 12 with an estimated likely impact of greater than 2m; 5 with an estimated possible impact of 1–2m)
 - (b) WCM: 41 (19 likely greater than 2m; 22 possible impact of 1–2m)
 - (c) Marburg Sandstone: 19 (9 likely greater than 2m; 10 possible impact of 1–2m)

These bores are located across 42 private properties.

- (2) 109 bores registered with DNRM that do not have an identified source aquifer, located on 27 properties
- (3) 12 bores registered with DNRM where the aquifer and property is not confirmed
- (4) 159 bores owned by New Hope Group (NAC or APC).

In total, 357 registered bores are either likely or possibly to be affected, with 198 of these owned by private landholders (69 of these landholders have been confirmed; the number of owners of 12 bores remains unconfirmed), with the balance of 159 owned by the proponent.

In addition, there is likely to be numerous unregistered bores that will be within the groundwater drawdown zone of mining operations.

Groundwater-dependent ecosystems

The AEIS confirms the location of potential groundwater-dependent ecosystems (GDEs) and wetlands in accordance with State Government's WetlandInfo database, overlaid with drawdown horizons for the basalt aquifer. The map confirms there are several mapped terrestrial GDEs (moderate confidence level) to the west and south of the project site, which are likely to be remnant vegetation largely associated with basalt ridges. The AEIS states that it is likely that at these locations the water table is below the rooting depth of trees, with dominant species likely to have a rooting depth of between 12–18m.

In addition, there are 'low confidence level' GDEs to the north west, south west, north east and south east of the project site, associated with alluvial sediments of Oakey and Myall creeks. Associated with the latter are also low confidence GDEs in the vicinity of groundwater discharge zones. The AEIS finds that some mapped GDE instances coincide with dams, and so the accuracy of their classification is questioned.

No GDEs within the project site and its surrounds are mapped as a high confidence level GDE.

Two GDE springs or waterholes are identified in the database, one located on Spring Creek around 9km northeast of the project site, and one on Oakey Creek around 10km south west of the site.

Modelling indicated no reductions in base flow within Myall and Oakey creeks are predicted. The AEIS found that it is not expected that the project will impact on any GDEs associated with these features.

Within the basalt aquifer, groundwater drawdown of between 1–3m within zones of mapped terrestrial GDEs is expected in a small area 1–2km to the northwest of the project site. Within the WCM, groundwater drawdown of between 10–20m within zones of mapped terrestrial GDEs is expected in a small area 1km west of the site.

8.6 Management of water resources

8.6.1 Surface water

To ensure the project does not affect surface water quality, the project's Water Resources Management Plan (Appendix J.4, EIS), which informs the EM Plan (Appendix C, AEIS) confirms the project's key principles for water management are:

- Divert clean water away from mine areas

- Mine-affected water to be captured, treated, re-used and if required, discharged into Lagoon Creek when water quality limits and discharge conditions are able to be met
- On-site monitoring of water quality to occur
- Efficient transfer and use of water supplies around the site to ensure best use of water resources.

Water quality control: site contaminants and work in creeks

Procedures for ensuring effective protection of surface water quality include:

- surface run off from potentially contaminated infrastructure areas will receive additional treatment (e.g. oil-water separator processing and bunding). Water captured in these areas will be reused on site, while captured oil will be recycled by a licensed contractor
- Progressive rehabilitation will be undertaken to reduce the amount of disturbed areas, with reseeded areas as soon as possible
- Control strategies for the onsite sewage water treatment plant are included in the EM Plan
- Fuel, dangerous goods and hazardous chemicals will be managed in line with regulatory standards, guidelines and in compliance with statutory requirements
- Refuelling locations and handling of fuels will be undertaken away from all waterways, including creeks and drainage paths
- Control strategies for erosion and sediment management to avoid and minimise water quality impacts and scouring are included in the EM Plan
- A conservation management zone will be established at the length of Lagoon Creek, with a 150m separation area each side from mine pits, and a 50m exclusion from all mine activities. The riparian area will be restored, which will work to improve water quality
- Commitments 116 and 202 (Appendix D, AEIS) state that specific environmental management conditions will be implemented to mitigate the impacts of the construction of the railway line crossing of Lagoon Creek. Workspaces will be located away from the creek banks; no construction to take place during wet periods, temporary barriers to be installed to minimise any disturbance to creek flows. Creek rehabilitation works are to be monitored.
- In terms of minimising harm to water supplies of nearby residents, commitment 126 confirms NAC will undertake water quality sampling in rainwater tanks should air quality monitoring exceed the air quality objectives in the EPP (Air) or dust nuisance goals.

Coordinator-General's conclusions

I have stated conditions (Appendix 2) to ensure sufficient controls are in place for the protection of surface water quality values due to site contaminants and works in Lagoon Creek, including:

- hazardous leachates are to be prevented being directly or indirectly released or at risk of being released to any watercourse

- release to waters must not cause erosion of the bed and banks of the receiving waters or cause material build-up of sediment
- temporary works in a watercourse must be undertaken in accordance with DNRM Guideline – Activities in a Watercourse, Lake or Spring Associated with Mining Activities
- contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters
- release to waters must be undertaken so not as to cause erosion of the bed and banks of the receiving waters or cause material build-up of sediment in such waters
- an Erosion and Sediment Control Plan must be developed to minimise erosion and the release of sediment to receiving waters and contamination of stormwater
- all effluent released from the treatment plant must be monitored at the frequency and for specified parameters for Sewage Effluent Quality Targets for Dust Suppression and Irrigation
- sewage effluent used for dust suppression or irrigation must not cause spray drift or overspray to any sensitive place
- effluent from sewage treatment facilities must be reused or evaporated and must not be directly released from the sewage treatment plant to any waterway.

Quality control: release events

Procedures detailed in the project's Water Resource Management Plan (WRMP) to ensure effective protection of surface water quality during release events include:

- water quality will be measured upstream and downstream of the project site. Monitoring will record salinity, pH, DO, EC, temperature monthly, or when water is present; and heavy metals, nutrients, anions and cations monitored twice a year
- sampling for metals, metalloids, nutrients and hydrocarbons will be conducted in dams that are part of the mine water management release system. Monitoring will be undertaken to inform a hazard assessment to determine if contaminants pose a risk to the receiving environment if discharged
- preferential use of water stored in environmental dams as a supplemental water source for coal washing, dust suppression and other activities to minimise the likelihood of off-site water discharges
- the potential for uncontrolled releases is unlikely given the location of the disturbance footprint in relation to the catchment topography. The on-site water storage capacity and WRMP has been designed to reduce the likelihood of uncontrolled discharges.

Coordinator-General's conclusions

The EIS states that controlled releases to Lagoon Creek and Spring Creek are a necessary aspect of the mine water balance to prevent good quality water increasing in salinity if retained on site.

The conditions I have stated about MAW releases at Appendix 2 are based on EHP's model mining conditions and are consistent with the conditions proposed by NHC in the updated EM Plan (AEIS).

Some minor changes have been made by EHP to better align the recommended conditions with site specific matters relevant to the project, for example, specified EC levels for receiving and discharge waters.

Tables included in Appendix 2 confirm where MAW can be released, the release sources, and the properties of receiving waters that must be accorded with before a release can occur.

I have conditioned that a stream flow gauge station is to be installed, operated and maintained to determine and record stream flows in Lagoon Creek upstream of the discharge sites.

The conditions note where, and how often, upstream monitoring of water conditions is to occur, as well as monitoring sites downstream of release points.

Contaminant release limits, such as EC and pH are also conditioned to control the amount and quality of water released. MAW release limits are included which note that EC limits are able to range from 700–3,500uS/cm. For the higher level of EC, flows in stream must be exceeding 4ML/day. For that scenario, a maximum of 0.5ML/day of water with an EC of 3,500 uS/cm is able to be released.

In a rare, high flow scenario with water flows exceeding 35ML/day, no more than 6ML/day of discharge with an EC of 3,500uS/cm could be released.

For low flow events, conditions state that for a period of 28 days after a natural flow event that exceeds 4 ML/d, an EC limit of 700uS/cm with a release no greater than 1.5ML/day would apply.

For EC, discharge limits have been set based on advice by EHP in light of data available about background conditions for EC in the area's water resources, which, particularly in the case of groundwater and standing pools of water in Lagoon Creek, have been shown to be high. However, EC levels are much lower during flow conditions.

As previously noted, draft Environmental Values (EVs) and Water Quality Objectives (WQOs) are currently under development by State Government for the project's catchment area.

When finalised, these are intended to be included in the EPP (Water). The EVs and WQOs would apply to the project if the area that the project is located in is regulated. In that case, any conditioning applied in the project's draft EA about water quality limits would be reviewed by DEHP to understand if there was alignment with the expectations of area-specific EVs and WQOs.

The conditions note that Spring Creek receives discharge from the mine site. This is permitted through the current operation's authorisation for use of this gully for discharge. The project as proposed will not make any changes to the discharge to Spring Creek.

The daily quantity of MAW released from each release point must be measured and recorded. DEHP is to be notified no later than 24 hours after a release event that a release has occurred, and confirm contaminant limits, natural flow conditions and discharge volumes were in accordance with set limits.

WRMP

I have further conditioned that the proponent must finalise and implement the WRMP proposed in the EIS (Appendix J.4).

The proponent's current water quality monitoring program should be expanded to incorporate the operational and decommissioning phases of the project.

The program is to ensure the WRMP is effective, to demonstrate compliance with the mine's strict discharge limits, and to ensure the downstream water quality (physico-chemical parameters, at a minimum) is not being adversely impacted.

The WRMP is to include the following actions:

- Water quality will be measured upstream and downstream of the project site.
- Basic water quality indicators (i.e. salinity, pH, DO, EC, temperature) will continue to be monitored on a monthly basis, or when water is present; and heavy metals, nutrients, anions and cations will be monitored twice annually at sensitive sites.
- During the discharge of mine affected water (refer table F3), the salinity of Lagoon Creek at monitoring site DS1 should not exceed 1,000µS/cm.
- The full set of upstream and downstream monitoring parameters included in the WRMP is to be approved by DEHP within 1 year from finalising of the Coordinator-General's report for the project.
- The proponent is to measure upstream at RP1 (refer Figure 2 – Surface water monitoring points) and downstream water quality at DS1 (refer Figure 2 – Surface water monitoring points) for the parameters included in the WRMP.

Quality control: design of structures

The EM Plan (AEIS) confirms:

- design and construction of all water management structures will use practical hydraulic parameters based on an appropriate risk based considerations of rainfall event, catchment size, slopes, discharge design and soil types
- Flood protection for resource areas will be provided through two flood levees designed to provide protection from a PMF flood event
- NAC has committed to ensuring the project's final landform is outside the existing PMF flood extent, and as a result, there will be no flooding impacts on voids and elevated landforms
- Commitment 233 (Appendix D, AEIS): culverts will be constructed for the rail spur in the area of the Lagoon creek flood plain to allow for overland flow of run-off
- Rail design parameters (Chapter 7, EIS) confirm that design will be to a 1-in-100 AEP and will incorporate culverts to ensure flows of surface water. The spur will be raised to around 2m in the vicinity of Jondaryan to account for increased flood

depths at this location. The rail spur will be designed in accordance with Aurizon standards.

Coordinator-General's conclusions

I acknowledge that the hydrodynamics of the Lagoon Creek catchment have been modified over time, most notably by agricultural activities in the area where channel definition has been decreased due to ploughing over sections of the creek or sediment loads from soil erosion has in-filled sections of the creek.

Such effects obviously make conditions experienced downstream worse in times of high flow events. I note local government has channelised the creek through the town of Jondaryan to alleviate the effects of high flows.

I have conditioned release limits for the amount of water the mine can discharge during flow events on the rare occasion the mine will be able to discharge into the creek. I am of the view that restoration of Lagoon Creek across the mine site will improve the channel's values and function.

I have conditioned controls at Appendix 2 to ensure on-site structures are built to minimise risks to people and the environment during high flow events, including:

- The final design level of the flood levee crest must be designed and constructed to protect mine areas from a predicted 1 000 ARI flood event
- The condition of the levee must at a minimum be assessed:
 - By the environmental authority holder within one week of any storm of intensity greater than 25 mm of rain within three hours; and
 - By a suitably qualified and experienced person at least once per year between the months of May and October inclusive (i.e. during the 'dry' season and before the onset of the 'wet' season)
- Any remedial works identified as needing to be undertaken to the structure must be commenced within 30 days
- Land disturbed by mining must be rehabilitated in accordance with extensive rehabilitation requirements as detailed in the conditions
- All regulated structures such as dams and levees must be designed by and constructed under the supervision of a suitably qualified and experienced person in accordance with the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)
- All regulated structures are to be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of floodwaters from entering the regulated dam from any watercourse or drainage line; and wall failure due to erosion by floodwaters arising from a watercourse
- There is required to be a current operational plan in place for the regulated structures
- The performance of each regulated dam must be assessed over a November to May period based on actual observations of the available storage in each regulated dam taken prior to 1 July of each year

- By 1 November of each year, storage capacity must be available in each regulated dam to meet the Design Storage Allowance (DSA) volume of the dam
- The holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority
- The holder must, immediately on becoming aware that a regulated dam 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
- A range of conditions regarding effective management of risk from tailings disposal is also detailed in the conditions
- Annual inspection reports: each regulated dam must be inspected each calendar year by a suitable qualified and experienced person
- At each inspection the condition and adequacy of all components of the regulated structure must be assessed and a suitable qualified and experienced person must prepare an annual inspection report containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure
- The suitable qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)
- Requirements for safe decommissioning and rehabilitation of structures are detailed in the conditions.

With regard to the construction of the rail spur and balloon loop, given this is intended to be located on the floodplain in the vicinity of private properties, I have conditioned (Appendix 1) that the construction of the rail infrastructure is to be of a standard that allows free flow of flood waters in such a way as to not cause, or increase, flood damage at a residential or commercial place.

Where this is unavoidable, as in the case described in the EIS where an edge of a paddock may experience additional inundation, compensation is to be negotiated with land owners.

Land owners and asset owners likely to be impacted by changes to the existing flooding/drainage system must be consulted prior to completion of the final rail spur design.

A suitably qualified person must document and certify that the design and construction of the rail component of the project is in accordance with the above requirements. In addition, the design is to align with criteria as stated in the Department of Transport and Main Roads (March 2010) Road Drainage Manual 2nd edition (or later version), and with Aurizon design standards.

Surface water availability: Coordinator-General's conclusions

I consider the effects from the mine's capture of around 3 per cent of the catchment's surface water for the life of mine to be minimal. I am satisfied that the project is not expected to have an impact on downstream watercourses or environmental values, including those located in the Murray Darling Basin area.

In addition, potential impacts on the sole licenced surface water user downstream of the mine where a reduction of around 0.5 per cent of the water allocation may be affected are small. While no submission was made by the allocation holder on the EIS or AEIS, should the user find the effect to be material, DNRM should be contacted to discuss the entitlement.

The project's mine water strategy to divert clean water flows away from the operations, along with any releases the project will make into the Lagoon Creek system, will work to alleviate the project's impact on surface water availability.

Additionally, the proponent's intention to revegetate and improve the riparian values for the extent of Lagoon Creek along the project site will improve the water quality values for the catchment by reducing sediment.

8.6.2 Groundwater

While the project will present significant impacts on groundwater resources due to in pit flows when mining below the water table occurs, it is noted the mine's bore use has reduced due to construction of a 45 km pipeline and purchase of supply from the Wetalla Wastewater Treatment plant, with up to 5,500 ML/year able to be supplied. While the project has a groundwater allocation of 1,412 ML/year across 4 aquifers, in 2012, only 41.20 ML was drawn from the bores.

The project will undertake significant in-filling of voids post-mining to reduce water impacts from these landforms. Voids will be benched and sloped to ensure amenity and safety. Conditions have been set by me that require minimum rehabilitation requirements for all final landforms so that impacts are minimised.

I am of the view that the EIS and AEIS provided a comprehensive analysis of water issues requiring targeted management. Modelling and monitoring approaches provided in the AEIS were informed by advice provided by IESC, DOTE, DEHP and DNRM. The remodelling undertaken in the AEIS provided an improved approach to understanding the project's likely effects on water in the area.

Impacts have been identified and appropriate avoidance, mitigation and management processes and solutions have been stated in the proponent's commitments, management plans, and through the stating of various controls by me in conditions and recommended conditions included in appendices 1–3 of this report.

Groundwater quality: Coordinator-General's conclusions

I have stated controls on the management of groundwater in conditions included in this report (Appendix 2). Key with regard to water quality is that the project must not release contaminants to groundwater. As such, the proponent will need to ensure that its site management of potential risks such as waste and in-pit rehabilitation are of a high standard, and in line with conditions I have stated on such matters.

I have further conditioned that post-mining, the land is to be rehabilitated to ensure no ongoing contamination to water, including groundwater. Rehabilitated land is to not allow for acid mine drainage and any contaminated land is to be remediated.

The updated Groundwater Monitoring and Impact Management Plan (GMIMP) (Appendix H, AEIS) confirms the proposed monitoring groundwater monitoring locations for the project. In accordance with advice received from DNRM, additional bores in the Marburg Sandstone and Alluvial Aquifer have been included.

I am satisfied that the project's proposed monitoring locations achieve a balanced spatial distribution of bores across all aquifers and adequately represent current and predicted future modelled impacted areas and aquifers at site.

The GMIMP groundwater monitoring sites are conditioned as required to be implemented in Appendix 2 (draft EA). Groundwater levels at the bores must be measured monthly, and water quality is to be monitored twice a year. This monitoring will ensure natural groundwater trends are identified and will work to provide certainty to affected boreholders on mine impacts on groundwater, as well as inform a wider understanding on the mine's effect on water resources.

The monitoring conditions set limits for contaminants for various analytes and conditions, including TDS, EC, and pH. It is noted that for some bores, monitored levels already exceed limit requirements (e.g. EC and TDS). All groundwater monitoring must be performed by an appropriately qualified person.

Groundwater user impacts: Coordinator-General's conclusions

In order to ensure impacts on authorised bore holders are quantifiable, baseline monitoring is to occur well in advance of operation. I have set a condition that states within 2 years following the issuing of the MLA for the project, the proponent must provide a report to each potentially affected authorised water user and to DNRM. The report must include a summary of the collected baseline information and address potential impacts to the groundwater supplies of those users.

The report must identify operational bores for each potentially affected authorised water user, and for each operational bore:

- identify natural groundwater levels and water quality
- identify the condition and supply capacity of the bore
- identify the operational requirements and current use of the bore
- clearly outline the predicted decrease in water level at the bore due to proposed mining operations
- provide an initial assessment of the likely water supply impacts to the affected authorised water users, and timing of those impacts, during and following the project activity
- outline of the potential future actions (make good measures) which would ensure the potentially affected authorised water users will have access to a reasonable quantity and quality of water for the authorised use and purpose of the bore/s.

As stated in the EIS, possible mitigation measures that may be applied by NAC to make good on water impacts include the refurbishment of an existing groundwater bore; installation of a new bore; establishment of an alternative water supply arrangement; or use of another mutually agreed form of mitigation.

Further, I have set conditions that state the proponent must enter into agreement with all potentially unduly affected water users about make good measures, or, if not about make good measures, another negotiated arrangement must be agreed on.

While modelling of groundwater impacts in the EIS took the standard industry approach of using a minimum impact quantification of 1m, an impact below this amount is considered an impact that must be accounted for by the proponent.

The agreement must be entered into at least 3 years prior to the time an unduly affected water user is predicted to become affected due to dewatering operations (based on the latest version of the project's numerical groundwater model at the time). This will allow staging of agreements to occur as the project progresses.

I have also conditioned a process as described in the *Water Act 2000* that should agreement with the parties not be able to be reached, and in the opinion of the Chief Executive for DNRM all reasonable attempts have been made to achieve agreement, then DNRM may, in consultation with the licensee and the affected water user, determine the make good measures to be taken.

Preceding this would be mediation undertaken by DNRM officers between the affected landholder and the proponent to understand the nature of impediments to reaching agreement on make good arrangements.

Water resource impacts: Coordinator-General's conclusions

I have set conditions requiring offsets to be provided by the proponent for any ongoing depletion of groundwater systems caused by the project (Appendix 3).

To refine an understanding of possible long term impacts on aquifers, I have conditioned that groundwater modelling must be undertaken during the life of the mine.

The numerical model as detailed in Appendix F: Groundwater Modelling Technical addendum' of the AEIS must be reviewed to incorporate groundwater monitoring data and measured mine dewatering volumes from the groundwater management and monitoring program also conditioned in my report.

The review must be conducted within 2 years of commencement of any mining activities associated with any Stage 3 operations (i.e. the removal of overburden) and at least every 3 years thereafter, or at other intervals specified by the administering authority in writing, which will occur if the observed groundwater levels are not consistent with those predicted by the groundwater model.

The review must provide a revised numerical groundwater model which incorporates additional relevant data associated with the Oakey Creek alluvial aquifer. The revised model must include:

- review of the hydrogeological conceptualisation used in the previous model
- an update of the predicted impacts
- revised water balance model
- review of assumptions used in the previous model
- predictions of changes in groundwater levels for a range of scenarios

- information about any changes made since the previous model, including data changes

A peer reviewed report outlining the justification for the refined model and the outputs of the refined model is required.

An evaluation of the accuracy of the predicted changes in groundwater levels and recommended actions to improve the accuracy of model predictions is to be provided.

A report outlining the findings and any recommendations from the review must be completed by an appropriately qualified person and submitted to DNRM for approval no later than 3 months after the commencement of the review.

A copy of findings is to be provided to the Commonwealth Minister for the Environment for information and any comment.

Groundwater Dependent Ecosystems: Coordinator-General's conclusions

I note that GDEs are likely to be associated with the alluvial aquifers system and the Tertiary Basalt. Therefore, I have conditioned the requirement to offset water lost from these systems due to project impacts. Such offsets are likely to benefit both community and environmental access to groundwater resources.

The project's MMP, recommended to the Minister for the Environment as a condition of approval in considering impacts on flora and TECs, will be required to consider potential groundwater effects on a small area of SEVT TEC located close to the Manning Vale West pit. Should it be demonstrated that this MNES would be affected by groundwater impacts, a decision will be required on management of the area.

As no high confidence GDEs were located in the project area, I am satisfied no further conditioning on this matter is required.

I am satisfied that the monitoring and modelling regime conditioned by me will quantify the extent of impacts caused by the project on water resources and offsets required will make water available for environmental use.

Oakey Creek alluvial aquifer: Coordinator-General's conclusions

Given the importance of alluvial systems particularly to communities and the environment, I have stated conditions that require any impacts on the Oakey Creek alluvial aquifer system to be remedied.

I have conditioned that after groundwater monitoring for the project has commenced and data is being analysed, NAC is required to provide a report to DNRM on groundwater impacts due to mining from the project.

This reporting requirement will commence when the second round of groundwater modelling discussed earlier has been provided to DNRM. Reporting is to be repeated for each subsequent round of modelling, so that confirmation of any actual impact can be understood and considered in the forward modelling regime.

The report is to be peer-reviewed by an independent contractor prior to being provided to DNRM. It will be required to:

- establish any identified impact associated with mining activities, if any, on the Oakey Creek Alluvial aquifer
- include an assessment of natural and potential pumping based water level variation caused by non-mining authorised users, in the Oakey Creek Alluvial aquifer
- outline any requirements for additional modelling or monitoring required.

If the investigation concludes that there is an identified impact on the Oakey Creek Alluvial aquifer as a result of mining activities, the proponent must determine the volumetric impact associated with the identified impact.

If the impact is determined to be the result of mining activities, the proponent may be required to construct additional monitoring bores. Additional monitoring bores are to be incorporated in the Groundwater Monitoring and Management Plan.

I have further conditioned that the proponent must offset any long term project related take of water from the Oakey Creek Alluvial aquifer as directed by DNRM.

Tertiary Basalt aquifer: Coordinator-General's conclusions

Given the importance of the Main Range Volcanics aquifer system to communities, industries and the environment as confirmed in the Commonwealth Murray Darling Basin Plan (2012) which regulates the amount of groundwater take for the system, I require any project impacts on this resource to be offset.

I have set conditions that the project's long term volumetric impact on this aquifer is to be considered in the second review of the project's numerical groundwater model and included in the impact report. Conditions align with the requirements for monitoring/modelling/reporting on actual impacts as described for the Alluvial aquifer.

The proponent must offset any project-related take of water from the Tertiary Basalt (Main Range Volcanics aquifer) as directed by DNRM. DNRM is to consult with regulatory bodies in determining any offset requirements before decisions are made.

The form of any offset will need to account for the permanent reduction in available take from the aquifers equivalent to the determined long term take accounted for in the model. This may be measurable up to the point that drawdown stabilises.

Offsets may comprise a retirement of part of all of an existing entitlement, or purchase and retirement of a new entitlement.

Walloon Coal Measures: Coordinator-General's conclusions

Under recent changes to the Water Act, the take of water from the WCM is to be regulated as 'associated water' when the new legislation comes into effect in early 2015. The take of water will be authorised under the Water Act, and as such there will be no requirement to offset this take.

However, as described in 'make good' provisions conditioned in this report, project impacts to licenced users of the WCM and any other impacted aquifers will be remedied.

Marburg Sandstone Aquifer: Coordinator-General's conclusions

The take of water from the Marburg Sandstone aquifer is regulated by the Water Resource Plan (Great Artesian Basin) 2006 and therefore an offset is not required.

I have conditioned that copies of all reports about groundwater monitoring and modelling for the project, along with decisions about offsetting requirements, are to be provided to the Commonwealth Minister for the Environment.

8.7 IESC

The New Acland Coal Mine Stage 3 project proposes the taking of an action involving large coal mining development that is likely to have a significant impact on a water resource. Therefore, in accordance with section 131AB, advice on the proposal was sought from the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC).

On 25 February 2014, DE and the Office of the Coordinator-General submitted a joint request for advice for the project to the IESC. On 10 April 2014 the IESC provided its advice to DE and the Office of the Coordinator-General.

The IESC advice has been considered in my evaluation of the project.

8.7.1 Issues raised by IESC

Matters of interest to the IESC from the project's EIS included:

- the hydrogeological conceptualisation
- the numerical groundwater model, particularly the parameters and boundary conditions
- variations in predicted drawdown and pit inflows; and
- existing surface water quality, flow and ecology data sets provided for Lagoon Creek, Myall Creek and Oakey Creek.

A copy of the IESC advice for the New Acland Stage 3 project (April 2014) is included in Appendix N AEIS and is available online at

<http://www.iesc.environment.gov.au/committee-advice/proposals/new-acland-coal-mine-stage-3-project-advice>

8.7.2 Proponent response

The AEIS confirmed the EIS groundwater modelling was updated in response to advice received by IESC, DNRM and EHP on modelling methodologies, appropriate guidelines and inputs. New data from monitoring bores (NAC, private and DNRM bores) and from observed mine pit inflows increased the model's calibration targets.

A sensitivity and uncertainty analysis was undertaken on the model to provide greater confidence in project impact predictions. In addition, results of the modelling were peer reviewed by an independent expert. The peer review report was included in the AEIS.

Appendix N, AEIS, provides a comprehensive response to each of the points raised by IESC in its advice on the project.

8.7.3 Outstanding concerns

DE, DEHP and DNRM have worked closely with the proponent through the EIS process to close-out issues raised by IESC and to ensure a greater degree of confidence could be demonstrated about likely impacts on water resources for the project and in mitigation measures to account for impacts.

I have conditioned the requirement for robust monitoring and iterative modelling during the life of the project in order to quantify impacts on water resources. This will provide an empirical dataset based on actual impacts that will determine groundwater offset requirements the proponent must supply to make good on long term impacts to water resources.

DNRM considered one issue has not been addressed in the AEIS. This relates to item 1b from the IESC advice, regarding model documentation.

IESC advised that a qualitative comparison between observed and modelled potentiometric heads for each layer, across pre-mining, operations, post-mining and long term scenarios, was suggested in order to better understand reliability of the modelling.

In its submission on the AEIS DNRM noted this point had not been addressed and requested further information from the proponent.

In summary, the proponent was of the view that future model updates will consider this requirement. The proponent added that additional monitoring bores and data, as per the proposed monitoring plan, will assist in the definition of vertical gradients between geologic units where nested sites are proposed, which will provide further rigour to the model.

I am of the view that the conditioned enhanced and ongoing monitoring and modelling program will provide a better understanding about hydrogeological conditions, including hydraulic connection between aquifers; ultimately leading to an understanding of actual project impacts across all groundwater systems.

8.8 Ecologically sustainable development

8.8.1 Principles

My assessment of the project has taken into account the principles of ecologically sustainable development, which as defined in Part 1, section 3A of the EPBC Act, are:

- **the integration principle:** decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations

- **the precautionary principle:** if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- **the inter-generational equity principle:** the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- **the biodiversity principle:** the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making
- **the valuation principle:** improved valuation, pricing and incentive mechanisms should be promoted.

I have considered the above principles in my evaluation. Based on the completion of a comprehensive environmental assessment process, in considering proponent commitments and the draft EM Plan, my stated conditions for the draft EA for the project (Appendix 2) and my recommendations for conditions to be placed on subsequent State and Commonwealth approvals, I am satisfied that the project complies with the provisions of Part 1, section 3A of the EPBC Act in accordance with the following criteria.

The integration principle

This report is the culmination of a rigorous assessment process addressing economic, environmental, social and equitable considerations. Following the reduction of the project scope in 2012, three stages of the EIS process have involved public consultation. All submissions received were considered as part of the evaluation process.

All long-term and short-term impacts for the mine will be managed through an EA which will be administered by DEHP (conditions to be applied are included in Appendix 2). I consider that by complying with my conditions (appendices 1, 2 and 3) and implementing all proposed management measures, the long-term and short-term economic, environmental and social impacts of the project are equitable and acceptable.

The precautionary principle

Based on the proponent's EIS and AEIS documentation, submissions made on the documentation and advice received from advisory agencies, I am satisfied that there is sufficient scientific information to conclude there will not be an unacceptable impact to the controlling provisions of the project. Where I consider there is insufficient information to support the proponent's conclusions, I have taken a conservative approach to documenting impact estimates. For example, I have required the following:

- Prior to commencing any project construction activities, the proponent must conduct pre-clearance ecological surveys of areas to be impacted, consistent with:
 - Queensland state government survey guidelines
 - Australian government threatened species guidelines.

- Regarding groundwater impacts, I have set conditions that require offsets for water lost due to groundwater drawdown effects of the project. The offsets apply to groundwater of sufficient quality to be used for the environment and communities.
- The proponent will be required to develop and implement a robust groundwater monitoring, iterative modelling and management program during the life of the project which will work to quantify the final offset requirements (Appendix 1)
- The proponent is required to develop an MNES Management Plan prior to commencing project stages with significant MNES impacts, consistent with relevant recovery plans, threat abatement plans and conservation advice to maximise ongoing protection and long-term conservation of EPBC listed species and communities on the project site.

The inter-generational equity principle

I am satisfied that the intergenerational principle has been adequately applied throughout my evaluation of the project; and I consider that the EIS process has sufficiently enabled submitters to raise concerns about the project in a fair and equitable manner.

Three public comment periods were facilitated throughout my assessment of the project at the TOR, EIS and AEIS stages in which members of the public, stakeholders and advisory agencies provided submissions. I have considered issues raised in my evaluation of the project to ensure the interests of all interested people were considered.

For further information of the number of submissions received and key issues raised, refer to section 3 of this report.

I am also satisfied that the intergenerational principle has been adequately applied throughout my conditioning. I consider that the conditions applied in appendices 1–3 will allow for the project to be constructed and operated in sustainable matter so as to protect MNES and the environment generally for future generations.

The biodiversity principle

The TOR that I finalised for the project outlined the requirements for the proponent's EIS, including the requirement to consider biodiversity conservation and ecological integrity. The biodiversity principle has been carried throughout all stages of the EIS process in both the proponent's assessment documentation and my evaluation.

I am satisfied that this principle has been adequately incorporated into my conditions for a draft EA for the project (Appendix 2), groundwater impact offset requirements conditioned in Appendix 3 and my recommended biodiversity conditions to the Commonwealth Minister for the Environment (Appendix 3). In addition, the proponent commitments and control strategies in the EM Plan will mitigate or offset residual impacts to biodiversity and ecological communities.

The valuation principle

I am satisfied that the project's adverse impacts on the environment will be suitably compensated through environmental biodiversity offsets for all unavoidable residual significant impacts (refer to section 8 of this report, the proponent's offsets strategy: Appendix M, AEIS, and my conditions in appendices 1 and 3). I consider that the cost of both direct and indirect offsets will be commensurate with the potential impacts on MNES and the environment generally.

8.9 Social and economic impacts

8.9.1 Social impact assessment

In accordance with the TOR, a social Impact assessment (SIA) was completed for the project identifying the potential social impacts and the proponent's mitigation and management measures. The SIA focused on community and stakeholder engagement, health and community wellbeing, housing and accommodation, local business and industry content and workforce management.

Potential positive impacts identified include:

- maintaining current and creating additional direct and indirect employment with a focus on local and regional recruitment strategies
- continued provision of education and training opportunities
- increased procurement opportunities for local and regional businesses
- preservation of historical sites of significance
- increased community support programs and initiatives.

Potential negative impacts include:

- impacts from mining operations in relation to air quality, noise, vibration and water resources
- change of land use from agriculture to mining and decreased rural amenity
- traffic safety and connectivity
- impacts on the local and regional housing market
- increased demand for health and education services.

The proponent proposes to address the potential impacts with a series of action plans, and as a result, has committed to the following actions to enhance, avoid mitigate or manage social impacts:

- implement improved policies and processes incorporating proactive rather than reactive strategies, a structured approach for the consultation and engagement of stakeholders and the dissemination of information
- introduce a real-time monitoring system for air quality, noise and blasting events and a groundwater monitoring program
- commit to investigate all community concerns promptly and appropriately to reduce impacts

- implement the Acland Management Plan that enables the community to be part of the decision-making process
- commit to maximise local employment during construction and operation to reduce the impact on the local housing market
- adopt the Queensland Resources and Energy Code of Practice for Local Content and implement strategies to build capacity for local service providers and businesses
- implement equal employment opportunities to recruit a diverse workforce including Indigenous people, women, school leavers and the unemployed
- provide structured training programs including apprenticeships and traineeships.

I have conditioned that monthly reporting on compliance with air, noise and vibration condition limits are to be made public by the proponent in order to share information with interested people. Further, I have set conditions requiring the provision of a new access road due to the additional travel distances that would occur as a result of proposed road diversions.

The project has the potential to provide employment, education, training and local and regional business opportunities following the implementation of the social impact mitigation and management strategies and actions committed to by the proponent. I have imposed a condition for the proponent to report annually for a period of five years on the effectiveness of all proposed social impact strategies, actions and outcomes from the commencement of construction and I require that all commitments are fully implemented (refer to Section 7 for detailed information on the social impact assessment and my findings).

With regard to economic impacts, the project will boost regional and state economies, with capital expenditure expected to be \$900 million over the project life. The project would create up to 260 construction jobs and 435 operational jobs. Section 6 provides my assessment of the project's impacts on the local, regional, state and national economies.

8.10 Coordinator-General's overall conclusions

I have reviewed all of the assessment documentation provided and I am satisfied that the proponent has adequately assessed any potential impacts on the controlling provisions under the EPBC Act as a result of the project. The proponent has provided information on mitigation measures, control strategies and monitoring programs in the project's draft EM Plan, the combined EIS and AEIS, proponent commitments list, and further information requested to inform my evaluation after the AEIS was released for comment. Offsets are to be provided for residual impacts.

My conditions in appendices 1 and 2 and my recommended conditions in Appendix 3 will supplement these measures, strategies and programs to ensure the requirements of the EPBC Act are met.

I consider that the requirements of the bilateral agreement have been satisfied. Based on my conclusions for each of the respective controlling provisions, I am satisfied that the project would not result in unacceptable significant impacts on MNES.

9. Conclusion

The New Acland Coal Mine Stage 3 project has undergone a comprehensive environmental impact assessment. In undertaking my evaluation, I have considered the EIS and AEIS prepared for this project, submissions on the EIS and AEIS (including agency advice) and additional documentation provided by the proponent at my request.

I am satisfied that the requirements of the SDPWO Act have been met and that sufficient information has been provided to enable the necessary evaluation of potential impacts, and the development of mitigation strategies and conditions of approval.

I consider that the proponent's mitigation measures, required by the conditions stated in this report, would result in acceptable overall outcomes and that the conditions in appendices 1–3 provide comprehensive and targeted controls to further manage potential impacts. The draft EA included at Appendix 2 is substantially complete and provides a sufficient set of measures to manage environmental matters for the project.

I conclude that the project would deliver significant economic benefits to both the local, regional and state economies. Employment benefits would be generated by the project over the 12-year project life—providing direct and indirect jobs, local, regional and Indigenous employment opportunities.

I am also satisfied that the material supplied by the proponent sufficiently addresses any potential impacts on MNES for the project.

Accordingly, I approve the New Acland Coal Mine Stage 3 project, subject to the conditions and recommendations in appendices 1–3. In addition, I expect the proponent's commitments, as included in the AEIS, to be fully implemented.

To proceed further, the proponent will be required to:

- undertake more detailed work in the detailed design phase of the project
- obtain EPBC Act approval
- obtain a range of state and local government approvals required for the project
- finalise and implement a range of management plans
- finalise the EOS.

Copies of this report will be issued to DE, DEHP, DNRM, DTMR and TRC. A copy will also be available on the Department of State Development, Infrastructure and Planning's website at www.dsdip.qld.gov.au/cg

Appendix 1. Imposed conditions

This appendix includes conditions imposed by the Coordinator-General under section 54B of the SDPWO Act. All of the conditions imposed in this appendix take effect from when this Coordinator-General's report is publicly notified.

In accordance with section 54B(3) of the SDPWO Act, I have nominated several entities to have jurisdiction for the conditions in this schedule.

General audit

Condition 1. Audit requirements

In order to verify the proponent's compliance with all conditions imposed by the Coordinator-General, the following third party auditing requirements must be applied for the whole of the project:

- (a) The audit period will:
 - (i) commence within one year of the project receiving the amended EA ('EA') and mining leases required for the project; and
 - (ii) end once Condition 1(f) has been satisfied for all imposed conditions.
- (b) Audits must be undertaken throughout the Audit Period on an annual basis during the project construction phase (Construction Audit).
- (c) Audits must be undertaken throughout the Audit Period every three years during the project operations phase or at such lesser frequency as agreed by the Coordinator-General in writing (Operations Audit).
- (d) Audits must be undertaken generally in accordance with *AS/NZS /ISO 19011:2014 Guidelines for auditing management systems* by a suitably qualified person, engaged by, and at the expense of the proponent.
- (e) The proponent must provide the Audit Report to the Coordinator-General within 30 business days after the end of the relevant Construction Audit or Operations Audit.
- (f) The Coordinator-General may determine that an imposed condition has been satisfied where:
 - (i) the condition (or its intent) has subsequently become a requirement of, or has been addressed through subsequent legislation or another regulatory approval; and
 - (ii) it is no longer appropriate that the matter be addressed by the Coordinator-General, as it is managed pursuant to other regulatory requirements, or
 - (iii) the condition (or intent) has been completed to the satisfaction of the Coordinator-General.

The Coordinator-General is to have jurisdiction for this condition.

General notification

Condition 2. Project milestone commencement dates

The proponent must notify the Coordinator-General and all nominated entities in writing of the granting of the EA and mining leases for the project; commencement of the construction phase and the commencement of the operation phase at least four weeks prior to the relevant commencement date.

The Coordinator-General is to have jurisdiction for this condition.

Monthly environmental monitoring reports

Condition 3. Environmental monitoring reports

From the commencement of construction for the New Acland Coal Mine Stage 3 project (the project), the proponent is to prepare and make publicly available each month (including online) environmental monitoring reports that address performance against EA conditions that set limits for air, noise, and vibration impacts.

The Coordinator-General is to have jurisdiction for this condition.

Rail infrastructure

Condition 4. Train load-out facility: New Acland Coal Mine Stage 3

- (a) The new train load-out facility, rail loop and rail spur for the project is required to be the sole distribution point for all railed product from the first day of operations of the stage 3 project.
- (b) The Coordinator-General is to be notified in writing at least two weeks prior to the new train-load out facility becoming operational.

The Coordinator-General is to have jurisdiction for this condition.

Condition 5. New Acland Coal Mine Stage 3: rail spur design

- (a) A suitably qualified person must certify that the design and construction of the rail spur:
 - (i) is in accordance with the design criteria in the Department of Transport and Main Roads (March 2010) Road Drainage Manual 2nd edition
 - (ii) meets the following criteria for a two per cent annual exceedance probability rainfall event (50-year Annual Recurrence Interval):
 - (A) not cause, or have the potential to increase flood damage at a domestic premises or commercial premises
 - (B) a maximum increase in afflux of 0.1m at a domestic premises or commercial premises
 - (C) a maximum increase in afflux of 0.2m at the Jondaryan-Muldu road, or existing electricity, water supply, sewage or telecommunications infrastructure in the town of Jondaryan
 - (D) a design objective of an increase in afflux of 0.3m, with a maximum increase in afflux of 0.5m at other locations
 - (E) a maximum culvert outlet velocity of 2.5m/s
 - (F) any increase in duration of floodplain inundation is not to exceed 72 hours or 20 per cent of existing flood duration (whichever is greater).
- (b) Certification is to be provided to the issuer of the infrastructure mining lease.

- (c) Land owners, residents, asset owners likely to be impacted by changes to the existing flooding/drainage system, and, at a minimum, Toowoomba Regional Council and the Queensland Reconstruction Authority must be consulted prior to completion of the final rail spur design.
- (d) Where the rail spur cannot be designed, constructed and maintained so as not to cause or increase flood damage at residential premises or at a commercial premises, compensation is to be negotiated with affected land owners, residents, and asset owners.

DNRM is to have jurisdiction for this condition.

Disturbance areas

Condition 6. Land resource survey

- (a) Prior to the commencement of operations for the project, for all mining lease areas associated with the project, the proponent must undertake a detailed land resource survey of the proposed mining disturbance areas (being pits, elevated landforms and slope batters) identified in the August 2014 *Additional information to the EIS: New Acland Coal Mine Stage 3 Project*.
- (b) The field survey of the disturbance areas is to meet the following requirements:
 - (i) be undertaken by an appropriately qualified person
 - (ii) have a minimum investigation site density of 1 site/10 hectares
 - (iii) provide a detailed description of the investigation site and associated soil profile at a minimum of 1 in 3 of the investigation sites
 - (iv) provide the results of the survey graphically on a map with a cartographic scale of 1:20,000 (i.e. 1cm² = 5 hectares)
 - (v) the descriptions of investigation sites and soil profiles are to be made in accordance with the *Australian soil and land survey field handbook* (NCST, 2009), with photographs of both the exposed soil materials and the sites to be included
 - (vi) the soil profile is to be described to the shallower of the following:
 - (A) a soil depth of 1m, or
 - (B) the depth where bedrock, a natural hardpan, weathered rock or a continuous gravel layer (any of which would ordinarily preclude penetration by plant roots) are intercepted
 - (vii) at those investigation sites where detailed soil profile descriptions are not undertaken, the investigation site is to be described and photographed, and the soil profile examined and described to a depth sufficient to:
 - (A) allow the soil to be assigned to an order and suborder under the Australian Soil Classification (Isbell 1996); and
 - (B) be accurately assigned to a soil unit represented in the disturbance area.
 - (viii) soil samples are to be collected at a minimum of 50 per cent of the investigation sites where detailed soil profile descriptions are made, with those samples to be:
 - (A) collected at the following profile depths:
 - (1) 0.0–0.1m
 - (2) 0.2–0.3m
 - (3) 0.5–0.6m; and
 - (4) 0.8–0.9m

- (ix) packaged, transported and stored in accordance with recommendations in Brown, A.J., (1999), *Soil sampling and sample handling for chemical analysis, in Soil Analysis: An interpretation manual*, eds. Peverill, K.I., Sparrow, L.A. & Reuter, D.J., CSIRO; or any specific advice provided by the laboratory that will be analysing the samples; and
- (x) analysed at a soil analysis laboratory providing NATA or ASPAC accredited analyses for the analytes and laboratory methods specified in Table A1 (below).
- (c) Concurrent with the preceding survey conditions, in order to establish reference sites (being, sites that will not be, or have not been, disturbed by mining activities) in line with the requirements of Condition 6(b), the following requirements are also to be met:
 - (i) detailed soil profile descriptions must be provided for at least three reference sites characterising each soil map unit identified in the land resource survey; and
 - (ii) soil samples must be analysed for at least three reference sites representing each soil type identified in the land resource survey.
- (d) Each of the land units identified in the land resource survey is to be assigned a land suitability classification.

The assigned land suitability classification is to be consistent with the relevant limitation description or criteria in the following publications:

- (i) where land units have historically supported cropping*:
the suitability framework for the Eastern Downs area provided in the *Regional Land Suitability Frameworks for Queensland* (DNRM & DSITIA, 2013), with the candidate crops for the classifications to include dryland cereal and grain crops (i.e. wheat, oats, barley and sorghum), sunflower and chickpeas.
 - (ii) where land units have historically been used for grazing:*.
the suitability framework for beef cattle grazing provided in Table 2.2 in the Land suitability assessment techniques, in Part B of *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (DME, 1995).
- (*Historic land use is to be determined on the basis of the dominant land use for that land unit depicted in the 1999 mapping produced for the *Queensland Land Use Mapping Program* (i.e. QLUMP99.)
- (e) Following the completion of the land resource survey, and prior to the commencement of the project's operations, a detailed report, including land resource and land suitability maps of the disturbance area, is to be produced and provided to the Coordinator-General.

That report and its associated maps must:

- (i) be prepared and certified by an appropriately qualified person
- (ii) document the data and information relating to the above listed items (a) to (d); and be submitted to the Coordinator-General for review and approval.

The Coordinator-General is to have jurisdiction for this condition.

Condition 7. Rehabilitation of disturbed land

- (a) Rehabilitation is to be undertaken so as to establish discrete land units (that is, no unjustified mixing of soil material from different land units) in the disturbed areas to be rehabilitated ('rehabilitation area'), each capable of ultimately being assigned a specific post-disturbance land use suitability.

- (b) The rehabilitation of disturbed land is to result in the affected land units being able to support the best post-disturbance land use possible. The post-disturbance land suitability of each land unit is to:
 - (i) represent that achievable on an ongoing basis
 - (ii) be obtainable without the use of irrigation; and
 - (iii) be such that collectively at least 50 per cent of the total area of disturbed land originally meeting or exceeding the criteria for either Class 3 grazing land or Class 4 cropping land still meet or exceed those classifications.
- (c) Prior to commencement of mining operations, the project proponent must:
 - (i) identify parcels of land, unaffected by mining operations (the land can be land owned by the proponent/associated company), that are able to provide at least three separate reference sites for each land suitability class to be represented in rehabilitated areas; and
 - (ii) Undertake investigations at each reference site, consistent with the requirements in Condition 6(b): Land resource survey, and sufficient to demonstrate that each reference site satisfies the criteria for the applicable suitability class.
- (d) Within nine months of the commencement of project operations, the proponent is to submit for approval by the Coordinator-General a set of rehabilitation success criteria.
- (e) The set of rehabilitation success criteria is to include elements specific to each land suitability class identified in the land resource survey undertaken in accordance with Condition 6: Land resource survey.
- (f) Rehabilitation success criteria should include measures related to the following:
 - (i) landform
 - (ii) soil physical and chemical attributes
 - (iii) erosive soil loss (estimated using the Revised Universal Soil Loss Equation (RUSLE))
 - (iv) vegetative cover
 - (v) plant density
 - (vi) dry matter yield of harvestable material; and
 - (vii) botanical composition (pasture) or weed population characteristics (crops).
- (g) The rehabilitation and restoration of the disturbed land is to be subject to ongoing and regular monitoring. At a minimum, the monitoring program is to:
 - (i) require monitoring twice in a calendar year (in spring and autumn in areas sown to pasture and at early flowering and at harvest in cropped areas)
 - (ii) provide a statistically valid sampling intensity for assessing compliance with the rehabilitation success criteria in each land unit (note: a sampling intensity providing 95 per cent confidence level that the sample mean values reported for a land unit are within ± 20 per cent of the true mean for that unit.)
 - (iii) Include relevant climatic data, including rainfall, for both the rehabilitation and reference sites; and
 - (iv) by way of comparison with the corresponding reference sites, determine progress in meeting restoration success criteria, including identifying any failings; and proposing means to rectify those failings.

The Coordinator-General is to have jurisdiction for this condition.

Condition 8. Reports and management plans

- (a) One year after commencement of rehabilitation works required by Condition 7, and then annually from that date, the proponent must publish the results of the monitoring program for the rehabilitation areas, which were obtained over the preceding year, in an annual report, with that report to be:
- (i) submitted to the Coordinator-General
 - (ii) available for download on the project proponent's website or a similar publicly-accessible internet portal, and
 - (iii) made available in a printed form.
- (b) Subsequent to complying with Condition 6: Land resource survey, and prior to the commencement of project operations, the proponent must submit to and have approved by the Coordinator-General, the following documents:
- (i) Final Land Use and Rehabilitation Plan; and
 - (ii) Topsoil Management Plan.

Table A1. Soil chemical and physical analytes and recommended methods

Analyte	Units	Methodology
pH _{1.5}		Method 4A1 in Rayment & Lyons (2011)
EC _{1.5}	dS/m	Method 3A1 in Rayment & Lyons (2011)
Chloride	mg/kg	Method 5A1, 5A2, 5A3 or 5A4 in Rayment & Lyons (2011)
Soil organic carbon	%	Method 6A1 in Rayment & Lyons (2011)
Total nitrogen	%	Method 7A1, 7A2, 7A3, 7A4 or 7A5 in Rayment & Lyons (2011)
Nitrate nitrogen	mg N/kg	Most appropriate method with 7B or 7C prefix in Rayment & Lyons (2011)
Total phosphorus	mg/kg	Method 9A1 in Rayment & Lyons (2011)
Bicarbonate phosphorus	mg/kg	Method 9B1 or 9B2 in Rayment & Lyons (2011)
Cation exchange capacity	cmol _c /kg	Most appropriate method in Table 15.2 in Rayment & Lyons (2011)
Exchangeable Ca, Mg, K and Na	cmol _c /kg	Most appropriate method in Table 15.2 in Rayment & Lyons (2011)
Soil particle size distribution for size ranges of >2, 2 – 0.2, 0.2 – 0.02, 0.02 – 0.002, and <0.002 mm diameters	% mass	Most appropriate method in Chapter 17 in McKenzie et al. (2002)
Soil moisture @ -1500 kPa	%	Method 504.01, 504.02 or 504.03 in McKenzie et al. (2002)
Exchangeable sodium percentage	%	Calculation from exchangeable Ca, Mg, K and Na
Exchangeable Ca: Exchangeable Mg		Calculation from exchangeable Ca, Mg, K and Na
Emerson aggregate stability	class	Method 513.01 in McKenzie et al. (2002)

Impacted land

Condition 9.

- (a) The proponent (or an associated entity) for the project is to secure land equivalent to the amount of land that will be permanently lost to agricultural use as a result of residual mine voids ('equivalent land').
- (b) The base-case total equivalent land amount required is 457 hectares, being the mine void area estimated to remain post-mining described in the August 2014 *Additional information to the EIS: New Acland Coal Mine Stage 3 Project*. The total equivalent land amount area may be further refined as mine planning progresses.
- (c) The equivalent land required is to be like for like; so that:
 - (i) the amount of permanently impacted land in the void areas defined as priority agricultural land use (PALU) (e.g. cropping); and
 - (ii) the amount of permanently impacted land in the void areas defined as non-PALU (e.g. grazing)
—is the amount of equivalent PALU and non-PALU land required to be secured elsewhere.The equivalent land may be secured across separate parcels of land.
(Note: PALU and non-PALU are as mapped in the State Government Queensland land use mapping program (QLUMP).
- (d) Each equivalent land area must be legally secured by registration of a covenant on the land title.
- (e) Commencement of covenants may be staged, with covenants for all equivalent land for each of the mine pits to be in place within one year from the start of operations for that pit.
- (f) The proponent is to notify the Coordinator-General within 20 business days of commencing operations in each of the mining pits. The notification is to include the predicted final void area for the pit/pits as the measure for the amount of equivalent land required.
- (g) The proponent is to notify the Coordinator-General within 20 business days of securing all covenants for the equivalent land areas for each mining pit.
- (h) Concurrent with conditions 9 (f) and (g), a report on secured equivalent land is to be submitted to the Coordinator-General for approval. The report is required to confirm how the land areas satisfy the equivalent land requirements of this condition.
- (i) The equivalent PALU land areas are to be maintained as PALU until surrender of the mining lease for the project is approved.
- (j) The equivalent non-PALU land areas are to be maintained as non-PALU until surrender of the mining lease for the project is approved.
- (k) The proponent is required to ensure the equivalent land areas are improved from the time of securement to enhance the productivity of the land uses (for example: soil erosion, pest and weeds, management, use).

The Coordinator-General is to have jurisdiction for this condition.

Groundwater

Condition 10. Groundwater management and monitoring program

- (a) A Groundwater Management and Monitoring Program must be developed and certified by an appropriately qualified person which addresses all phases of the mining operation approved under the project's environmental authority ('project's EA').
- (b) The groundwater management and monitoring program must be provided to the administering authority for the *Water Act 2000* for approval in accordance with the requirements of the baseline monitoring program in relevant conditions of the project's EA.
- (c) The groundwater management and monitoring program must be developed to ensure that the plan meets the following objectives:
 - (i) validation of groundwater numerical model (including review of boundary and recharge conditions) to refine and confirm accuracy of groundwater impacts predicted;
 - (ii) groundwater level monitoring in all identified geological units present across and adjacent to the mine site to confirm existing groundwater flow patterns and monitor drawdown impacts;
 - (iii) estimation of groundwater inflow to mine workings and surface water ingress to groundwater from flooding events using the groundwater model;
 - (iv) monitoring in any identified source aquifers for alternative water supplies, relevant to any approval issued under the *Water Act 2000* for the project;
 - (v) monitoring of geological units throughout all phases of project life including for the period post-closure as required by the administering authority for the *Water Act 2000*;
 - (vi) identifying monitoring bores that will be replaced due to mining activities; and
 - (vii) to ensure all potential groundwater impacts from mine dewatering and mine water and waste storage facilities (artificial recharge) are identified, mitigated and monitored.
 - (viii) A copy of the approved groundwater management and monitoring program is to be provided to the Commonwealth Department of the Environment.

DNRM is to have jurisdiction for this condition.

Condition 11. Monitoring Program Review

- (a) The groundwater management and monitoring program required under condition 10 must be reviewed by an appropriately qualified person in conjunction with the Groundwater Model Review (Condition 12, below) with a report provided on the outcome of the review to the administering authority within two years from the issuing of the project's EA and mining lease/s required for the project; and then no later than 1 July every 3 years following. The review must include:
 - (i) an assessment of the outcome of the groundwater management and monitoring program against the objectives in the project's EA
 - (ii) a review of the adequacy of the monitoring locations, frequencies and groundwater quality triggers specified in the project's EA
 - (iii) a review of the adequacy of the groundwater monitoring program to support the requirements outlined in Condition 12.

DNRM is to have jurisdiction for this condition.

Condition 12. Groundwater model review

- (a) The numerical model in the report titled 'Groundwater Model Technical addendum' - New Acland Coal Stage 3 Project (AEIS, 2014) must be reviewed to incorporate groundwater monitoring data and measured mine dewatering volumes from the groundwater management and monitoring program in the project's EA.
- (b) The review must be conducted within 2 years of commencement of any mining activities associated with any mine box cut excavation for the project and at least every 3 years thereafter, or at other intervals specified by the administering authority for the Water Act 2000 in writing, if the observed groundwater levels are not consistent with those predicted by the latest version of the groundwater model.
- (c) The review must provide a revised numerical groundwater model outlined in condition 12a), which incorporates additional relevant data associated with the Oakey Creek alluvial aquifer. The revised model must include:
 - (i) review of the hydrogeological conceptualisation used in the previous model
 - (ii) an update of the predicted impacts
 - (iii) revised water balance model
 - (iv) review of assumptions used in the previous model
 - (v) predictions of changes in groundwater levels for a range of scenarios
 - (vi) information about any changes made since the previous model, including data changes
 - (vii) a report outlining the justification for the refined model and the outputs of the refined model
 - (viii) an evaluation of the accuracy of the predicted changes in groundwater levels and recommended actions to improve the accuracy of model predictions
- (d) A report outlining the findings and any recommendations from the review under condition 12, must be completed by an appropriately qualified person and submitted to the administering authority for approval no later than 3 months after the commencement of the review.
- (e) A copy of the approved report relating to conditions 11 and 12 is to be provided to the Commonwealth Department of the Environment.

DNRM is to have jurisdiction for this condition.

Ecology

Condition 13. Environmental Offset Strategy (EOS)

- (a) The proponent must prepare a detailed EOS that:
 - (i) details any offset requirements conditioned by the Commonwealth Minister for the Environment in any approval for the project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
 - (ii) details offsets required to address significant residual impacts on matters of state environmental significance consistent with (a)(i)
 - (iii) includes:
 - (A) a detailed description of the land to which the plan relates, the values affected and the extent and likely timing of impact on each value
 - (B) evidence that values impacted can be offset

- (C) the offset delivery mechanism(s) comprising one or more of: land-based offsets; direct benefit management plans; offset transfers and/or offset payments.
- (iv) confirms a legally binding mechanism that ensures protection and management of offset areas will be applied
- (v) includes an offset proposal for impacts on koala habitat. The offset must be land-based and benefit the local koala population.
- (b) The offsets strategy must be provided to the Coordinator-General for approval within 60 days after an approval decision under the EPBC Act
- (c) The approved offsets strategy must be implemented if the project proceeds.

The Coordinator-General is to have jurisdiction for this condition.

Condition 14. Pre-clearance fauna and flora surveys

- (a) Prior to commencement of any project construction activities, the proponent must conduct pre-clearance ecological surveys of areas to be impacted, consistent with:
 - (i) Queensland state government survey guidelines
 - (ii) Requirements of the Nature Conservation Act 1992
 - (iii) Australian government threatened species guidelines.
- (b) The surveys must be sufficient to identify the extent to which the following will be unavoidably impacted by the project:
 - (i) protected wildlife listed under the Nature Conservation Act 1992
 - (ii) matters of state environmental significance as defined by the State Planning Policy
 - (iii) MNES as listed under the EPBC Act
- (c) The surveys must include areas of potential foraging, roosting or nesting habitat for the painted honeyeater (*Grantiella picta*). If the painted honeyeater is found during pre-clearance surveys, then any significant impacts on its habitat may require additional offsets in accordance with the EOS for the project.
- (d) If protected plants are found during pre-clearance surveys, then impacts may require a permit under the *Nature Conservation Act 1992* and offsets under *the Environmental Offsets Act 2014*.
- (e) Should additional MSES species be located that were not previously identified during field surveys, the development of management plans and/or additional offsets may be required to address any significant residual impacts for matters of state environmental significance in accordance with the EOS for the project.
- (f) Notification of the discovery of additional protected plants or MSES species that will be impacted is to be provided to the administering authority within five business days of the discovery. The proponent is required to propose how the species is to be managed and to seek advice from DEHP on the undertaking.
- (g) Survey results must be included in an updated EOS for the project.

DEHP is to have jurisdiction for this condition.

Condition 15. Lagoon Creek Conservation Zone Management Plan (CZMP)

- (a) The proponent is required to implement and maintain the Lagoon Creek Conservation Zone.
- (b) The extent of the Lagoon Creek Conservation Zone is to be as described in Figure 4-1 Rehabilitation Plan, Appendix J6, EIS, January 2014. The CZMP specifically addresses

the Lagoon Creek corridor and the remnant and rehabilitation zone on Bottle Tree Hill as shown on Figure 4-1.

- (c) The proponent must develop and implement a Lagoon Creek Conservation Zone Management Plan (CZMP) that aims to achieve:
 - (i) control and management (including fencing) of stock from the area
 - (ii) a program of weed management to assist natural regeneration of native species and protect remnant areas from impacts of weed invasion;
 - (iii) suitable monitoring and maintenance strategies.
- (d) There is to be a revegetated area of at least 50 metres either side of the high bank of Lagoon Creek within the conservation zone. Should instream storage such as a dam or other infrastructure be constructed within the conservation zone, the proponent must ensure no net loss of the required buffer. The holder of the project's EA is authorised to construct and maintain an appropriately engineered haul road crossing of Lagoon Creek as part of the access route for coal haulage. The haul road crossing structure within Lagoon Creek must not significantly impede the ephemeral flow regime or create a barrier for fish movement during periods of flow within the creek.

Table A2. Lagoon Creek Rehabilitation Targets

Site-based condition attributes*	Target after 10 years
Recruitment of woody perennial species	3 overstorey species present as regeneration
Native plant species richness	9 species present—specific attention to trees that provide koala habitat
Tree canopy cover (%)	20%
Tree canopy height	9.5m
Shrub layer cover (%)	3%
Native perennial grass cover (%)	65%
Native perennial forb and non-grass cover (%)	7.5%
Native annual grass, forb and non-grass cover (%)	2.5%
Large trees	35 large trees
Fallen woody material	None proposed
Weed cover (%)	<20% weed cover
Litter cover (%)	None proposed

*Neldner, V.J. et al. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.2. Updated August 2012. Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane. 124 pp.

- (e) The date of commencement of the 10 year period for achieving the rehabilitation targets in Table A.2 is within 2 months of the issuing of the project's EA and the obtaining of the mining leases for the project.
- (f) Long term protection of values of the CZMP through establishing suitable tenure or other mechanism.
- (g) The CZMP is to ensure that suitable monitoring and maintenance strategies are implemented and that the outcomes and progress of revegetation and management programs are published and updated on the company website.

- (h) A progress report is to be provided to the authority administering the *Environmental Protection Act 1994* on an annual basis, including any actions required to address unsuccessful revegetation or translocation efforts. The outcomes of these actions are to be reported on in subsequent report/s.

DEHP is to have jurisdiction for this condition.

Condition 16. Koala Species Management Plan (KSMP)

- (a) The proponent is to prepare and implement a KSMP for the project consistent with the requirements of the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 (EPA 2006).
- (b) The KSMP is required to address:
 - (i) staff awareness training
 - (ii) the staging or limiting of vegetation clearance to what is required for safe and efficient mining operations
 - (iii) the exclusion of vegetation clearance between the hours of 6pm and 6am
 - (iv) the sequential clearance of trees under the guidance of a licenced and experienced Koala Spotter to locate fauna prior to clearing of habitat and allow their safe dispersal
 - (v) identification of fauna movement corridors and the use of exclusion fencing around dangerous or high risk operational mining area or transport routes
 - (vi) for less high risk areas, identification and implementation of suitable fauna movement control devices (e.g. fences) and management responses, and
 - (vii) rehabilitation within the Lagoon Creek Conservation Zone and across the balance of the site with koala food trees.
- (c) The recommendations and actions in the project's approved Environmental Management Plan (EM Plan), and the project's approved Conservation Zone Management Plan are to be consistent with the KSMP.
- (d) The KSMP is required to be provided the authority administering the *Nature Conservation Act 1992* for approval at least six months prior to the commencement of clearing or construction works for the project.

DEHP is to have jurisdiction for this condition.

Social impacts

Condition 17. Social Impact Management Report (SIMR): pre-construction

- (a) Commencing from the date of this Coordinator-General's Evaluation Report and up to the date of commencement of construction, every six months the proponent is to provide the SIMR to the Coordinator-General. The reports are to be made publicly available by the proponent.
- (b) The SIMR is to contain:
 - (i) the actions taken to inform the community about project impacts and show that community concerns about project impacts have been taken into account
 - (ii) the actions, outcomes and adaptive management strategies to avoid, manage or mitigate project-related impacts on community health safety and social infrastructure.

The Coordinator-General is to have jurisdiction for this condition.

Condition 18. SIMR: construction and operation

- (a) From commencement of construction, the proponent is to provide to the Coordinator-General on an annual basis for a period of five years, a SIMR (construction and operation). The reports are to be made publically available by the proponent.
- (b) The SIMR (construction and operation) is to describe:
 - (i) the actions taken to inform the community about project impacts and show that community concerns about project impacts have been taken into account.
 - (ii) the actions, outcomes and adaptive management strategies to avoid, manage or mitigate project-related impacts on community health safety and social infrastructure
 - (iii) the actions, outcomes and adaptive management strategies to avoid, manage or mitigate project-related impacts on local and regional housing markets
 - (iv) the actions, outcomes and adaptive management strategies to enhance local employment, training and development opportunities.

The Coordinator-General is to have jurisdiction for this condition.

Glossary for Appendix 1

appropriately qualified person	A person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and who can give an assessment, advice and analysis of pertinent data and information using protocols, standards, guidelines, methods and literature that are acceptable to the Coordinator-General.
the project	The project of the size and scope as defined in the Coordinator-General's report for the New Acland Coal Mine Stage 3 project 2014
construction of the project	Commencement of any construction works related to the project
operations of the project	Commences when excavation of any of the pits required for the New Acland Coal Mine Stage 3 project begins
Priority Agricultural Land Use	(PALU) is a highly productive agriculture land use (including cropping, perennial and seasonal horticulture, production from irrigated agriculture and plantations, and intensive horticulture) identified in a regional plan for an area of regional interest
non-PALU	Non-PALU is an agricultural land use not identified as a PALU in the Darling Downs Regional Plan, and includes grazing modified and native vegetation, production forestry, intensive animal husbandry and dairy.

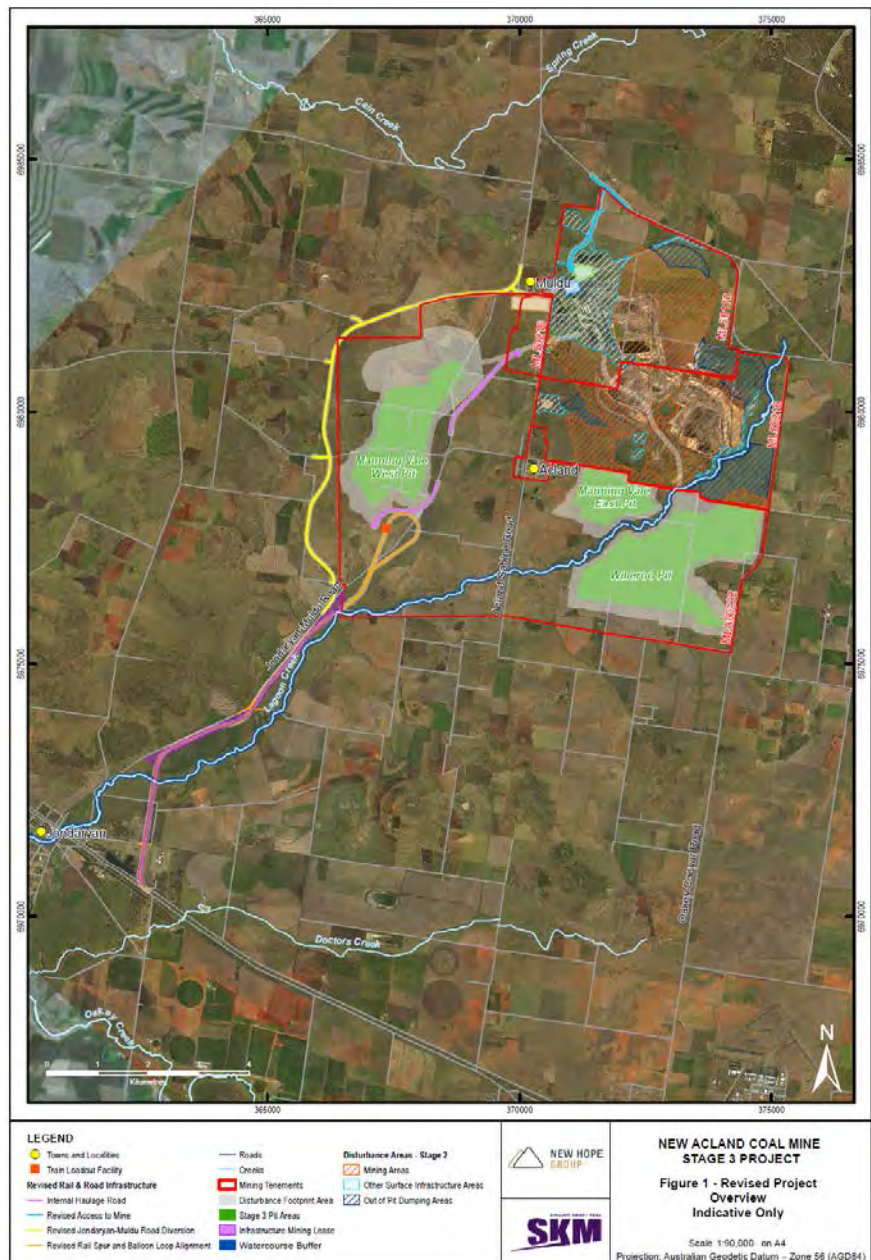
Appendix 2. Stated conditions

Section 1 Draft Environmental Authority

This appendix includes the Coordinator-General's stated conditions for the draft environmental authority for the New Acland Coal Mine Stage 3 project under the *Environmental Protection Act 1994* and are stated pursuant to section 47C of the *State Development and Public Works Organisation Act 1971*.

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.
- A2 In carrying out the mining activity authorised by this environmental authority, the holder of this environmental authority must comply with Figure 1 (Revised Project Overview – Mine Area)



- A3 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

- A4 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.
- A5 Upon request from the administering authority, copies of monitoring records and reports will 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.
- A6 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.

Financial assurance

- A7 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.
- A8 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

- A9 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standards Australia Risk management – Principles and guidelines (AS/NZS ISO 31000:2009), or the latest edition of a Standards Australia for risk management, to the extent relevant to environmental management, prior to the commencement of mining activities.

Notification of emergencies, incidents and exceptions

- A10 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.
- A11 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

- A12 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.
- A13 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

- A14 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.
- A15 Where a condition of this environmental authority requires compliance with a standard, policy or guideline 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 conditions H3 to H36, 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

Dust and particulate matter monitoring

- B1 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 Standards Australia AS/NZS 3580.10.1 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) Standards Australia AS/NZS 3580.9.6 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) Standards Australia AS/NZS 3580.9.9 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM₁₀ low volume sampler - Gravimetric method; or
 - (3) Standards Australia AS 3580.9.8 Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser;
 - (c) 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.
- B2 If monitoring indicates the potential for exceedance of the relevant limits in condition B1 then the environmental authority holder must immediately implement dust abatement measures to avoid exceeding the relevant limits.

Air emissions management

- B3 An Air Emissions Management Plan must be developed by a suitably qualified person and implemented. The Air Emissions Management Plan must incorporate a program for continuous improvements for the management of dust resulting from mining operations with respect to, but not limited to:
- (a) The collection of air quality and meteorological data in accordance with Table A: Air quality monitoring requirements;
 - (b) A system to identify adverse meteorological conditions likely to produce elevated levels of dust including PM10 at a sensitive or commercial place due to the mining conditions; and
 - (c) A dust control strategy which activates a timely implementation of dust control management actions aimed to avoid elevated levels of dust including PM10 at a sensitive or commercial place due to mining activities.

B4 A copy of the Air Emissions Management Plan and any changes to the Air Emissions Management Plan must be provided to DEHP on request.

Table A. Air quality monitoring requirements

Monitoring location*	Air quality indicator	Instrument	Frequency	Air quality limit	Nuisance limit	Monitoring method
1,2 (Acland)	PM ₁₀	TEOM	Continuous	50µg/m ³ (24 hr avg)		AS 3580.9.8-2008
	TSP	Hi-Vol Sampler	24hr, 1 day in 6	90µg/m ³ (annual)	80µg/m ³ (24 hr avg)	AS/NZS 3580.9.3:2003
	TSP ^{#1}	Modified TEOM [#]	Continuous	90µg/m ³ (annual)	80µg/m ³ (24 hr avg)	Modified TEOM
	Insoluble solids	Dust gauge	Monthly		120mg/m ² /day	AS/NZS 3850.10.1:2003
	Wind speed and direction		Hourly			AS 3580:14-2011
35,36 (west of mine site)	PM ₁₀	TEOM	Continuous	50µg/m ³ (24 hr avg)		AS/NZS 3580.9.8-2008
	TSP	Hi-Vol Sampler ¹	24hr, 1 day in 6	90µg/m ³ (annual)	80µg/m ³ (24 hr avg)	AS/NZS 3580.9.3:2003
	Insoluble solids	Dust gauge	Monthly		120mg/m ² /day	AS/NZS 3850.10.1:2003
Acland-Silverleigh Road (at site on Fig 3-2 where real time PM ₁₀ and dust deposition is monitored.	PM ₁₀	TEOM	Continuous	50µg/m ³ (24 hr avg)		AS/NZS 3580.9.8-2008
	TSP	Hi-Vol Sampler	24hr, 1 day in 6	90µg/m ³ (annual)	80µg/m ³ (24 hr avg)	AS/NZS 3580.9.3:2003
	Insoluble solids	Dust gauge	Monthly		120mg/m ² /day	AS/NZS 3850.10.1:2003
as per Figure 3-2.	Insoluble solids	Dust gauge	Monthly		120mg/m ² /day	AS/NZS 3850.10.1:2003
Siting of monitoring equipment						AS/NZS 3580.1.1:2007

*See Figures 3-1 and 3-2 Revised Environmental Management Plan (New Acland AEIS)

*See Figures 3-1 and 3-2 Revised Environmental Management Plan (New Acland AEIS, August 2014)

Data from the modified TEOM and Hi-Vol samplers to be used to calibrate the modified TEOM for monitoring TSP. Calibration needs to be undertaken over at least a 6 month period from June to December. Once the modified TEOM has been calibrated it can be used to measure TSP instead of the Hi-Vol sampler.

¹ The modified TEOM can be used to measure TSP at other sites.

Schedule C—Waste management

- C1 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.
- C2 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.
- C3 The holder of this environmental authority may dispose of inert waste (packing material) associated with blasting into open pits, buried in such a manner that it will not impede saturated aquifers.

Disposal of Tyres

- C4 Scrap tyres resulting from the mining activities can be disposed of into open pits provided tyres are placed as deeply in the spoil as reasonably possible and this practice does not cause an unacceptable fire risk or compromise mine safety.
- C5 Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers or compromise the stability of the consolidated landform.

Tailings disposal

- C6 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) maintaining records of the relative locations of any other waste stored within the tailings
 - (e) rehabilitation strategy
 - (f) 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.

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 (existing operations) and Table D1b – Noise limits (operations) to be exceeded at a sensitive place or commercial place.

Table D1a – Noise limits (existing operations)

Noise level dB(A) measured as	All days		
	7am – 6pm	6pm – 10pm	10pm – 7am
Noise measured at a 'Noise sensitive place'			
L _{Ar} , 1hour	50	45	40
L _{Amax}	-	-	50

Table D1b – Noise limits (operations*) (includes construction activities)

Noise level dB(A) measured as	All days		
	7am – 6pm	6pm – 10pm	10pm – 7am
Noise measured at a 'Noise sensitive place'			
L _{Aeq, adj, 15 min}	42	42	37
L _{Amax}	-	-	50
L _{Amax} rail spur	-	-	56
L _{Aeq(24hr)} rail spur	-	-	50

D2 Noise limits in **Table D1a – Noise limits (existing operations)** only apply until the commencement of mining activities (removal of overburden) for the Manning Vale East Pit, the Manning Vale West Pit or the Willeroo Pit as shown on Figure 1.

D3 If monitoring indicates the potential for exceedance of the relevant limits in **Table D1a** and **Table D1b – Noise Limits** then the environmental authority holder must immediately implement noise abatement measures to avoid exceeding the relevant limits.

Airblast overpressure nuisance

D4 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	
	Monday to Friday 7am to 6pm Saturday 9am to 1pm	Monday to Friday 6pm to 7am Saturday 1pm to 9am Sunday and Public Holidays
Airblast overpressure	115 dB (Linear) Peak for 9 out of 10 consecutive blasts initiated and not greater than 120 dB (Linear) Peak at any time	No blasting
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	No blasting

Monitoring and reporting

D5 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 15 to 60 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.

D6 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 90% of all blasts undertaken on this site in each year at the nearest sensitive place or commercial place to the centroid of the blast.
- (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

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

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 E1 - Groundwater monitoring locations and frequency for quality characteristics identified in Table E2 - Groundwater quality triggers and limits.

Table E1 - Groundwater monitoring locations and frequency

Monitoring Point	Aquifer Compliance Bore (C)	Location (GDA94 – Zone 56)		Parameter ¹ and Monitoring Frequency
		Easting (m)	Northing (m)	
2289P	Coal measures (C)	371265	6983532	Groundwater levels: monthly
2291P	Coal measures (C)	374620	6980033	
18P	Coal measures (C)	371028	6982641	
25P	Coal measures (C)	374146	6982057	Groundwater quality: Six monthly to include: Al, As, Ca, Se, Cl, Cu, F, Fe, Total N, K, Mg, Mn, Na, SO ₄ , HCO ₃ , TDS, EC, pH
26P	Coal measures (C)	374266	6982977	
27P	Coal measures (C)	373360	6983554	
28P	Coal measures (C)	372328	6983977	
843	Basalt (C)	370698	6981283	
848	Coal measures (C)	370705	6981723	
81P	Coal measures (C)	375003	6979638	
82P	Coal measures (C)	373697	6978814	
83P	Coal measures (C)	371854	6979679	
84P	Basalt (C)	370355	6982187	
BMH1	Basalt (C)	369658	6982204	
CSMH1	Coal measures (C)	375404	6977336	
109P	Basalt	368263	6982378	
122PGC	Coal measures	370656	6977837	
114P	Coal measures	371806	6976037	
116P	Coal measures	374220	6975132	
119PGC	Coal measures	371609	6973337	
120WB	Coal measures	367523	6976115	
121WB	Coal measures	368472	6978441	
1A	Basalt	366548	6982090	
1B	Coal measures	366548	6982090	
2A	Basalt	365884	6979300	
2B	Coal measures	365884	6979300	
3A	Basalt	369416	6973707	
3B	Coal measures	369416	6973707	
4A	Basalt	365800	6977025	
4B	Coal measures	365800	6977025	
4C	Marburg Sandstone	365800	6977025	
5A	Oakey Creek alluvium	373845	6972482	
5B	Coal measures	373845	6972482	
5C	Marburg Sandstone	373845	6972482	
6	Coal measures	375435	6975738	

7A	Basalt	367572	6982694
7B	Coal measures	367572	6982694
8	Mine Pit Backfill	372514	6982689

1 - Aluminium (Al), Arsenic (As), Calcium (Ca), Selenium (Se), Chloride (Cl), Copper (Cu), Fluorine (F), Iron (Fe), Total Nitrogen (Total N), Potassium (K), Magnesium (Mg), Manganese (Mn), Sodium (Na), Sulphate (SO₄), Bicarbonate (HCO₃), Total dissolved solids (TDS), Electrical conductivity (EC), Acidity/alkalinity (pH)

Table E2 - Groundwater quality triggers and limits

Parameter	Units	Contaminant Limit ^{1,5}	Monitoring frequency
Al	mg/l	5.0	Half yearly
As	mg/l	.05	Half yearly
Ca	mg/l	1000	Half yearly
Se	mg/l	0.02	Half yearly
Cl	mg/l	TBA	Half yearly
Cu	mg/l	1.0 ²	Half yearly
F	mg/l	TBA	Half yearly
Fe	mg/l	TBA	Half yearly
NO ₃	mg/l	400	Half yearly
NO ₂	mg/l	30	Half yearly
K	mg/l	TBA	Half yearly
Mg	mg/l	TBA	Half yearly
Mn	mg/l	TBA	Half yearly
Na	mg/l	TBA	Half yearly
SO ₄	mg/l	1000	Half yearly
HCO ₃	mg/l	TBA	Half yearly
TDS	mg/l	5000 ^{2,3}	Half yearly
EC	mg/l	7460 ^{2,3,4}	Half yearly
pH	unit	TBA	Half yearly

1 – Based on Stockwater limits defined in ANZECC (2000)

2 – Defined for beef cattle based on landholder bore survey results

3 – Existing bores 27P, 28P, 2289 and 118P background levels already exceed this limit prior to mine operation

4 – Based on EC to TDS conversion factor of 0.67 as per ANZECC (2000)

E4 Groundwater levels when measured at the monitoring locations specified in Table E1 - Groundwater monitoring locations and frequency must not exceed the groundwater level trigger change thresholds specified in Table E3 - Groundwater level monitoring below.

Table E3 – Groundwater level monitoring¹

Monitoring Point	Level trigger threshold
2289P	TBA
2291P	TBA
18P	TBA
25P	TBA
26P	TBA
27P	TBA
28P	TBA
843	TBA
848	TBA
81P	TBA
82P	TBA
83P	TBA
84P	TBA
BMH1	TBA
CSMH1	TBA
109P	TBA
122PGC	TBA
114P	TBA
116P	TBA
119PGC	TBA
120WB	TBA
121WB	TBA
1A	TBA
1B	TBA
2A	TBA
2B	TBA
3A	TBA
3B	TBA
4A	TBA
4B	TBA
4C	TBA
5A	TBA
5B	TBA
5C	TBA
6	TBA
7A	TBA

Monitoring Point	Level trigger threshold
7B	TBA
8	TBA

¹ To be provided – Water level trigger thresholds will be proposed following 12 months of monitoring of the new bores and following the first update of the groundwater model prior to the operation of the revised project.

Exceedance investigation

- E5 If quality characteristics of groundwater from compliance bores identified in Table E1 - Groundwater monitoring locations and frequency exceed any of the trigger levels stated in Table E2 - Groundwater quality triggers and limits or exceed any of the groundwater level trigger threshold stated in Table E3 - 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 E1 - Groundwater monitoring locations and frequency, must not exceed any of the limits defined in Table E2 - 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

- 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 2 attached to this environmental authority.

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

Release Point (RP) 1	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Mine-affected water source and location 1	Monitoring Point	Receiving waters description
ED1	27° 15' 40.5603" S	151° 41' 48.32659" E	ED1	Overflow from ED1	Spring Creek
ED2	27° 16' 54.96167" S	151° 41' 36.83113" E	ED2	Overflow from ED2	Lagoon Creek
ED3	27° 18' 29.40913" S	151° 42' 50.52694" E	ED3	Overflow from ED3	Lagoon Creek
ED4	27° 17' 41.49436" S	151° 41' 33.60156" E	ED4	Overflow from ED4	Lagoon Creek
ED5	TBA	TBA	ED5	Overflow from ED5	Lagoon Creek

ED6	TBA	TBA	ED6	Overflow from ED6	Lagoon Creek
ED7	TBA	TBA	ED7	Overflow from ED7	Lagoon Creek

F3 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
Electrical conductivity (uS/cm)	Release limits specified in Table F3 for variable flow criteria	Real time telemetry for EC and pH. Daily grab samples if telemetry not available If telemetry is unavailable, the first sample must be taken within 2 hours of commencement of release
pH (pH Unit)	6.0 (minimum) 9.0 (maximum)	
Total suspended solids (mg/l)	100	Daily during release (the first sample must be taken within 2 hours of commencement of release)

F4 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.

Mine-affected Water Release Events

- F5 The holder must ensure a stream flow gauging station/s is installed, operated and maintained to determine and record stream flows in Lagoon and Spring Creek upstream of the discharge sites.
- F6 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 F2 – Mine-affected water release limits for the release point(s) specified in Table F1 – Mine-affected water release points, sources and receiving waters.
- F7 The release of mine affected water to waters in accordance with condition F6 must not exceed the Maximum Release Rate (for all combined release point flows) for each receiving water flow criterion for discharge specified in Table F3 – 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.
- F8 The daily quantity of mine affected water released from each release point must be measured and recorded.
- F9 Release to waters must be undertaken so not as to cause erosion of the bed and banks of the receiving waters or cause material build-up of sediment in such waters.

Table F3 – Mine-affected water release during flow events

Receiving waters/stream	Release Point (RP)	Gauging Station (GDA94)	Gauging Station (GDA94)	Receiving Water Flow Criteria for discharge (m3/s)	Maximum release rate (for all combined RP flows)	Electrical Conductivity Release Limits
Lagoon Creek	ED2	27° 16' 54.96167" S	151° 41' 36.83113" E	Low Flow <4ML/d for a period of 28 days after natural flow events that exceed 4 ML/d	<1.5ML/d	700
	ED3	27° 18' 29.40913" S	151° 42' 50.52694" E			
	ED4	27° 17' 41.49436" S	151° 41' 33.60156" E			
	ED5	TBA	TBA	Medium Flow (low) >4 ML/d	<1.5ML/d	1500
	ED6	TBA	TBA		<0.7ML/d	2,500
	ED7	TBA	TBA	Medium Flow (high) >11.5 ML/d	<0.5ML/d	3,500
					<4.2ML/d	1500
					<2ML/d	2,500
	High Flow >35ML/d				<1.3ML/d	3,500
					<12.5ML/d	1500
<8ML/d					2,500	
				<6ML/d	3,500	
Spring Creek	ED1	27° 15' 40.5603" S	151° 41' 48.32659" E	Low Flow <4ML/d for a period of 28 days after natural flow events that exceed 4 ML/d	<1.5ML/d	700

Notification of Release Event

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.

- F11 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 F10 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 F10 and F11, provided the relevant details of the release are included within the notification provided in accordance with conditions F10 and F11.

- F12 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.
- F13 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

- F14 The quality of the receiving waters must be monitored at the locations specified in Table F5 - Receiving water upstream background sites and downstream monitoring points for each quality characteristic and at the monitoring frequency stated in Table F4 - Receiving waters contaminant trigger levels.

Table F4 – Receiving waters contaminant trigger levels

Quality Characteristic	Trigger Level	Monitoring Frequency
pH	6.5 – 9.0	Daily during the release
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	700	
Total 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 F5 – Receiving water upstream background sites and downstream monitoring points

Monitoring Points	Receiving Waters Location Description	Latitude (GDA94)	Longitude (GDA94)
Upstream Background Monitoring Points			
LCU1	Lagoon Creek at a point upstream of mine	27° 18' 9.7728" S	151° 44' 23.136" E
LCU2	Spring Creek at a point upstream of mine	27° 14' 18.7728" S	151° 41' 31.2864" E
Downstream Monitoring Points			
LCD1	Lagoon Creek downstream of mine	27° 18' 35.64" S	151° 43' 4.3536" E
LCD2	Lagoon Creek downstream of mine	27° 18' 37.36" S	151° 43' 1.8768" E
SCD1	Spring Creek at a point downstream of mine	27° 14' 47.364" S	151° 40' 36.2028" E
DS1	Located at the downstream boundary of ML50232* (*or any subsequent identifier for the ML required for the New Acland Coal Mine Stage 3 project)	27° 19' 26.68" S	151° 41' 7.02 E

- F15 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in Table F4 – 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 additional monitoring and reporting action is required; or
 - (b) where the downstream 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 (b) of this condition, no further reporting is required for subsequent trigger events for that quality characteristic.

F16 All determinations of water quality and biological monitoring must be performed by an appropriately qualified person.

Annual Water Monitoring Reporting

F17 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.

Water Management Plan

F18 A Water Resource Management Plan must be developed by an appropriately qualified person and implemented

Stormwater and Water sediment controls

F19 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.

F20 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 F19.
- (b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with condition F18 for the purpose of ensuring water does not become mine affected water.

Schedule G—Sewage treatment

G1 All effluent released from the treatment plant must be monitored at the frequency and for the parameters specified in Table G1 – Sewage Effluent Quality Targets for Dust Suppression and Irrigation.

Table G1 – Sewage Effluent Quality Targets for Dust Suppression and Irrigation

Contaminant	Unit	Release limit	Limit type	Frequency
5-day Biochemical oxygen demand (uninhibited)	mg/L	20	Maximum	Quarterly
Faecal coliforms, based on the average of a minimum of five samples collected	Colonies/100ml	1000	Maximum	Quarterly
pH	pH units	6.0 – 9.0.	Range	Quarterly

- G2 Treated sewage effluent used for dust suppression or irrigation must not exceed sewage release limits defined in Table G1 – Sewage Effluent Quality Targets for Dust Suppression and Irrigation.
- G3 Sewage effluent used for dust suppression or irrigation must not cause spray drift or overspray to any sensitive place.
- G4 Subject to condition G5, sewage effluent from sewage treatment facilities must be reused or evaporated and must not be directly released from the sewage treatment plant to any water way or drainage line.
- G5 In periods of wet weather or following wet weather, when no irrigation of effluent is reasonable practicable and when effluent storage ponds are full, the release of effluent to waters is permitted in accordance with the release limits in Table F2 – Mine-affected water release limits and locations specified in Table F 1 – Mine-affected water release points, sources and receiving waters.
- G6 The holder of the environmental authority must ensure that irrigation of effluent is carried out in such a manner that prevents and or minimises environmental harm.
- G7 The holder of this environmental authority is authorised to accept treated wastewater from the Wetalla Wastewater Reclamation Facility.

Schedule H—Land and rehabilitation

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

Table H1 – Rehabilitation Requirements

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Solid Waste Rock Disposal	Safe	Site safe for humans and animals	Structurally safe and shallow slopes (geotechnically stable). No hazardous materials (geochemically benign).	Monitoring / observation demonstrates safe site
	Non-polluting	No environmental harm attributed to adverse chemical conditions within the waste rock dumps	Minimise erosion (to at least <10t/ha/yr) through selective placement of mine waste, adequate vegetation cover. Runoff and seepage does not cause environmental harm	Suitable for low intensity grazing. Runoff and discharge water (including seepage) meets specified limits.
	Stable	Minimise erosion	Wastes selectively placed above and below original ground level to agreed slopes. Adequate ground cover established to control erosion. Runoff control measures (contour banks, etc) effective in controlling erosion.	Suitable for low intensity grazing
	Self-sustaining	To return to agreed grazing land capability	Slope and other landform design criteria achieved. Establish adequate vegetation cover.	Refer Table H2 and Table H3
Tailings Dams	Safe	Site safe for humans and animals	Structurally safe (geotechnically stable). Adequate capping. Accessibility to voids is permanently removed.	Monitoring / observation demonstrates safe site
	Non-polluting	Acid mine drainage will not cause environmental harm	Adequately capped. Minimise erosion through adequate vegetation cover to less than 10t/ha/yr. Runoff and seepage controlled by water management.	Monitoring meeting release limits. Suitable for low intensity grazing
	Stable	Minimise erosion	Stored in both pits below natural surface level and in dams above natural surface. Establish adequate vegetation cover.	Monitoring demonstrates revegetation success. No structural erosion present. Suitable for low intensity grazing

Mine Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Mine Infrastructure Areas	Self-sustaining	To return to agreed grazing land capability	Monitoring demonstrates successful revegetation.	Refer Table H2 and Table H3
	Safe	Site safe for humans and animals	Hazardous materials removed.	Monitoring / observation demonstrates safe site
	Non-polluting	Undertake contaminated land assessment.	Remediate contamination so that runoff and seepage are of good quality.	Monitoring meeting release limits.
	Stable	Minimise erosion	Remove infrastructure or allow continued use of useful infrastructure. Establish adequate vegetation cover.	Slope will be a maximum of 17° (30%)
	Self-sustaining	To return to agreed grazing land capability	Return to previous use (grazing). Establish adequate groundcover.	Refer Table H2 and Table H3
Linear Infrastructure areas	Safe	Site safe for humans and animals	Structurally safe (geotechnically stable).	Monitoring / observation demonstrates safe site
	Non-polluting	No environmental harm attributed to adverse chemical conditions within the rehabilitation areas.	Runoff and seepage controlled by water management (e.g. dams).	Monitoring meeting release limits.
	Stable	Minimise erosion	Remove infrastructure, rip reshape and revegetate or allow continued use of useful infrastructure.	Suitable for low intensity grazing
	Self-sustaining	To return to agreed grazing land capability	Remove infrastructure or allow continued use of useful infrastructure. Establish adequate vegetation cover.	Refer Table H2 and Table H3

Table H2 – Rehabilitation Acceptance Criteria – Grazing Lands

Land Suitability Class	Acceptance Criteria – Grazing Land						
	Non-polluting	Stability and Sustainability Land Use					
	Active Rill / Gully Erosion	Vegetation Cover	Native and Exotic Grass Species Diversity (spp./ha)	Slopes	Geo-technical Stability	Active Rill / Gully Erosion	Declared Weeds
2 to 5	Absence (<10t/ha/yr)	> 50%	≥ 4	Maximum 17°	stable	absence	absence

Table H3 – Rehabilitation Acceptance Criteria – Treed Areas

Land Suitability Class	Acceptance Criteria – Grazing Land Treed Areas						
	Non-polluting	Stability and Sustainable Land Use					
	Active Rill / Gully Erosion	Vegetation Cover (including tree / shrub canopy)	Native Tree / Shrub & Native / Exotic Grass Species Diversity (spp./ha)	Slopes	Geo-technical Stability	Active Rill / Gully Erosion	Declared Weeds
2 to 5	Absence (<10t/ha/yr)	> 50%	Eucalyptus spp. ≥ 2 Acacia spp. ≥ 2 Other tree / shrub spp. ≥ 2 Grass ≥ 3	Maximum 17°	stable	absence	absence

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

Regulated Dams and Levees

H3 The consequence category of any structure must be assessed by a suitable qualified and experienced person in accordance with the Manual for Assessing Categories and Hydraulic Performance of Structures (EM635) at the following times:

- (a) Prior to the design and construction of the structure, if it is not an existing structure; or
- (b) If it is an existing structure, prior to the adoption of this schedule; or
- (c) Prior to any change in its purpose or the nature of its stored contents.

- H4 A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence for more than one structure.
- H5 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 Consequence Categories and Hydraulic Performance of Structures (EM635).

Design and construction of a regulated structure

- H6 Condition H7 to H11 inclusive do not apply to existing structures
- H7 All regulated structures must be designed by and constructed under the supervision of a suitable qualified and experienced person in accordance with the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635).
- H8 Construction of a regulated structure is prohibited unless the holder has submitted a consequence category assessment report and certification to the administering authority has been certified by a suitably qualified person for the design and the design plan and the associated operating procedures in compliance with the relevant condition of this authority.
- H9 Certification must be provided by the suitable qualified and experienced person who oversees the preparation of the design plan set out in the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635), and must be recorded in the Regulated Dams/Levees register.
- H10 Regulated structures must:
 - (a) be designed and constructed in accordance with and conform to the requirements of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635);
 - (b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:
 - (1) floodwaters from entering the regulated dam from any watercourse or drainage line; and
 - (2) wall failure due to erosion by floodwaters arising from any watercourse or drainage line.
 - (c) (only for regulated dams associated with a failure to contain seepage) 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.
- H11 Certification by the suitable 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.

Operation of a regulated structure

- H12 Operation of a regulated structure, except for an existing structure, is prohibited unless the holder has submitted to the administering authority:
 - (a) One paper copy and one electronic copy of the design plan and certification of the 'design plan' in accordance with condition H8.

- (b) A set of 'as constructed' drawings and specifications, and
- (c) Certification of those 'as constructed drawings and specifications' in accordance with condition H9, and
- (d) 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;
- (e) The requirements of this authority relating to the construction of the regulated structure have been met;
- (f) The holder has entered the details required under this authority into a Register of Regulated Dams; and
- (g) There is a current operational plan for the regulated structures.

H13 For existing structures that are regulated structures:

- (a) Where the existing structure that is a regulated structure is to be managed as part of an integrated containment system for the purposes of sharing DSA volume across the system, the holder must submit to the administering authority within 12 months of the commencement of this condition a copy of the certified system design plan including that structure; and
- (b) There must be a current operational plan for the existing structures.

H14 Each regulated structure just be maintained and operated for the duration of its operational life until decommissioned and rehabilitated in a manner that is consistent with the current operational plan and if applicable the current design plan and associated certified 'as constructed' drawings.

Mandatory reporting level

- H15 Conditions H16 to H19 inclusive apply to Regulated Structures which have not been certified as low consequence category for 'failure to contain – overtopping'.
- H16 The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of the dam it is clearly observable.
- H17 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.
- H18 The holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence on any unauthorised discharges from the regulated dam.
- H19 The holder must record any changes to the MRL in the Register of Regulated Structures.

Design storage allowance

- H20 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.
- H21 By 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 of the dam (or network of linked containment systems).
- H22 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 system) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.

H23 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.

Annual inspection report

H24 Each regulated dam must be inspected each calendar year by a suitable qualified and experienced person.

H25 At each inspection the condition and adequacy of all components of the regulated structure must be assessed and a suitable qualified and experienced person must prepare an annual inspection report containing details of the assessment and include recommended actions to ensure the integrity of the regulated structure.

H26 The suitable qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635).

H27 The holder must:

- (a) Within 20 business days of receipt of the annual inspection report provide to the administering authority:
 - (1) the recommendations section of the annual inspection report; and
 - (2) if applicable, any actions being taken in response to those recommendations; and
- (b) If, following receipt of the recommendations and (if applicable) actions, the administering authority requests a full copy of the annual inspection report from the holder, provide this information to the administering authority within 10 business days of receipt of the request.

Transfer arrangements

H28 The holder must provide a copy of any reports, documentation and certifications prepared under this authority, including but not limited to and Register of Regulated Structures, consequence assessment, design plan and other supporting documentation, to a new holder on transfer of this authority.

Decommissioning and rehabilitation

H29 Dams must not be abandoned but be either:

- (a) Decommissioned and rehabilitated to achieve compliance with condition H30; or
- (b) Be left in-situ for a beneficial use(s) provided that:
 - (1) it no longer contains contaminants that will migrate into the environment; and
 - (2) it contains water of a quality that is demonstrated to be suitable for the intended beneficial use(s); and
 - (3) the administering authority, the holder of the environmental authority and the landholder agree in writing that the dam will be used by the landholder following cessation of the resource activity.

H30 After decommissioning, all significantly disturbed land caused by carrying out of the resource activity must be rehabilitated to meet the final acceptance criteria:

- (a) The landform is safe for humans and fauna;
- (b) The landform is stable with no subsidence or erosion gullies for at least three (3) years;
- (c) Any contaminated land (e.g. contaminated soils) is remediated and rehabilitated;

- (d) Not allowing for acid mine drainage; or
- (e) There is no ongoing contamination to waters (including groundwater);
- (f) All significantly disturbed land is reinstated as defined in Table H1 – Rehabilitation requirements;
- (g) For land that is not being cultivated by the landholder:
 - (1) groundcover, that is not a declared pest species is established and self-sustaining;
 - (2) vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining; and
 - (3) the maintenance requirements for rehabilitated land are no greater than that required for the land prior to its disturbance caused by carrying out of the resource activity.
- (h) For land that is cultivated by the landowner, cover crop is revegetated, unless the landholder will be preparing the site for cropping within 3 months of resource activities being completed.

Register of Regulated Dams

- H31 A Register of Regulated Dams must be established and maintained by the holder for each regulated dam
- H32 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.
- H33 The holder must make a final entry of the required information in the Register of Regulated Dams once compliance with condition H12 and H13 has been achieved.
- H34 The holder must ensure that the information contained in the Register of Regulated Dams is current and complete on any given day.
- H35 All entries in the Register of Regulated Dams must be approved by the chief executive officer for the holder of this authority, or the delegate, as being accurate and correct.
- H36 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.

Contaminated Land

- H37 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.
- H38 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.
- H39 Minimise the potential for contamination of land by hazardous contaminants.

Biodiversity offsets

H40 Significant residual impacts to prescribed matters of state environmental significance must not exceed the maximum authorised residual impact area listed for that matter in Table H4 - Matters of State Environmental Significance.

Note: Deemed conditions in Sections 18, 22, 24 and 25 of the *Environmental Offsets Act 2014* are taken to be conditions of this authority.

H41 The holder of the environmental authority must provide an environmental offset for the following maximum significant residual impacts on matters of state environmental significance in accordance with the requirements of the *Environmental Offsets Act 2014* (including deemed conditions), the Environmental Offsets Regulation 2014 and the Queensland Environmental Offsets Policy 2014.

Table H4 – Maximum authorised impacts on endangered and of concern regional ecosystems

RE	VM Act status	Maximum area of residual impact (ha)
11.3.1	Endangered	12
11.3.21	Endangered	35.9
11.9.5	Endangered	12.6
11.3.2	Of concern	4.8
11.3.17	Of concern	7
11.8.11	Of concern	4.1
11.9.10	Of concern	4.1
11.9.13	Of concern	3.6

Common name <i>Species name</i>	NC Act status	Total area of residual impact (ha)
Koala <i>Phascolarctos cinereus</i>	Special least concern	19.5
Belson's Panic <i>Homopholis belsonii</i>	Endangered	70.8

H42 Residual impacts are not authorised on any Matters of State Environmental Significance not identified in Table H4 – Matters of State Environmental Significance.

Glossary for Appendix 2

Words and phrases used throughout these recommended conditions are defined below. Where a definition for a term is not provided, 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	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.
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affected person	someone whose drinking water can potentially be impacted as a result of discharges from a dam or their life can be put at risk due to dwellings or workplaces being in the path of a dam break flood.
airblast overpressure	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	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.
annual inspection report	<p>an assessment prepared by a suitably qualified and experienced person containing details of the assessment against the most recent consequence assessment report and design plan (or system design plan):</p> <ul style="list-style-type: none"> • against recommendations contained in previous annual inspections reports; • against recognised dam safety deficiency indicators; • for changes in circumstances potentially leading to a change in consequence category; • for conformance with the conditions of this authority; • for conformance with the 'as constructed' drawings; • 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); • for evidence of conformance with the current operational plan.
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 or assessment by a suitably qualified and experienced person in relation to a consequence assessment of a dam	<p>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:</p> <ul style="list-style-type: none"> • 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	operations of any kind and all things constructed, erected or installed for that dam; and any land used for those operations.

authority	an environmental authority or a development approval.
background , with reference to the water schedule	the average of samples taken prior to the commencement of mining from the same waterway that the current sample has been taken.
blasting	the use of explosive materials to fracture: <ul style="list-style-type: none"> • rock, coal and other minerals for later recovery; or • structural components or other items to facilitate removal from a site or for reuse.
Certification	assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by the Manual (<i>Manual for Assessing Categories and Hydraulic Performance of Structures</i> (EM635)), including design plans, 'as constructed' drawings and specifications, construction, operation or an annual report regarding regulated structures, undertaken in accordance with the Board of Professional Engineers of Queensland Policy Certification by RPEQs (ID: 1.4 (2A)).
Certifying, certify or certified	a corresponding meaning as certification
chemical	<ul style="list-style-type: none"> • an agricultural chemical product or veterinary chemical product within the meaning of the <i>Agricultural and Veterinary Chemicals Code Act 1994</i> (Commonwealth); or • a dangerous good under the Australian Code for the Transport of Dangerous Goods by Road and Rail approved by the Australian Transport Council; or • a lead hazardous substance within the meaning of the Workplace Health and Safety Regulation 1997; • 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 • any substance used as, or intended for use as: <ul style="list-style-type: none"> – a pesticide, insecticide, fungicide, herbicide, rodenticide, nematocide, miticide, fumigant or related product; or – a surface active agent, including, for example, soap or related detergent; or – a paint solvent, pigment, dye, printing ink, industrial polish, adhesive, sealant, food additive, bleach, sanitiser, disinfectant, or biocide; or – a fertiliser for agricultural, horticultural or garden use; or – a substance used for, or intended for use for mineral processing or treatment of metal, pulp and paper, textile, timber, water or wastewater; or – manufacture of plastic or synthetic rubber.
commercial place	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.
Consequence in relation to a structure as defined	the potential for environmental harm resulting from the collapse or failure of the structure to perform its primary purpose of containing, diverting or controlling flowable substances.
Consequence category	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 Consequence Categories and Hydraulic Performance of Structures (EM635).
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.
dam	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.
dam crest volume	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 (for example, via spillway).
design plan	a document setting out how all identified consequence scenarios are addressed in the planned design and operation of a regulated structure.
design storage allowance or DSA	an available volume, estimated in accordance with the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> 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	the certifier of the design plan for the regulated dam.
development approval	a development approval under the <i>Integrated Planning Act 1997</i> or the <i>Sustainable Planning Act 2009</i> in relation to a matter that involves an environmentally relevant activity under the <i>Environmental Protection Act 1994</i> .
disturbance of land	includes: <ul style="list-style-type: none"> • compacting, removing, covering, exposing or stockpiling of earth; • removal or destruction of vegetation or topsoil or both to an extent where the land has been made susceptible to erosion; • carrying out mining within a watercourse, waterway, wetland or lake; • the submersion of areas by tailings or hazardous contaminant storage and dam/structure walls; • 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 • releasing of contaminants into the soil, or underlying geological strata. <p>However, the following areas are not included when calculating areas of disturbance:</p> <ul style="list-style-type: none"> • areas off lease (e.g. roads or tracks which provide access to the mining lease);

	<ul style="list-style-type: none"> • areas previously disturbed which have achieved the rehabilitation outcomes; • 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); • 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; • disturbance that pre-existed the grant of the tenure.
EC	electrical conductivity.
effluent	treated waste water released from sewage treatment plants.
emergency action plan	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.
existing structure	a structure that was in existence prior to the adoption of this schedule of conditions under the authority.
Extreme Storm Storage	a storm storage allowance determined in accordance with the criteria in the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> published by the administering authority
flowable substance	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 category	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.
holder	<ul style="list-style-type: none"> • where this document is an environmental authority, any person who is the holder of, or is acting under, that environmental authority; or • where this document is a development approval, any person who is the registered operator for that development approval.
hydraulic performance	the capacity of a regulated dam to contain or safely pass flowable substances based on the design criteria specified for the relevant consequence category in the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> .
infrastructure	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	land excluding waters and the atmosphere, that is, the term

this document	has a different meaning from the term as defined in the <i>Environmental Protection Act 1994</i> . For the purposes of the <i>Acts Interpretation Act 1954</i> , it is expressly noted that the term land in this environmental authority relates to physical land and not to interests in land.
land use	the selected post mining use of the land, which is planned to occur after the cessation of mining operations.
leachate	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.
levee	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.
licensed place	the mining activities carried out at the mining tenements detailed in this environmental authority.
low consequence dam	any dam that is not a high or significant consequence category as assessed using the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i>
m	metres
mandatory reporting level or MRL	a warning and reporting level determined in accordance with the criteria in the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> published by the administering authority.
manual	the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> published by the administering authority.
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.
mine-affected water	the following types of water: <ul style="list-style-type: none"> 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 <i>Environmental Protection Regulation 2008</i> 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 <i>Erosion and Sediment Control Plan</i> 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

	<ul style="list-style-type: none"> v. groundwater from the mines dewatering activities; vi. a mix of mine affected water (under any of paragraphs i-v, above) and other water.
	<p>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:</p> <ul style="list-style-type: none"> • 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 • 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: <ul style="list-style-type: none"> – areas that are been capped and have monitoring data demonstrating hazardous material adequately contained with the site; – 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 – both.
modification or modifying	see definition of construction
NATA	National Association of Testing Authorities, Australia.
natural flow	the flow of water through waters caused by nature.
non polluting	having no adverse impacts upon the receiving environment.
operational plan	<p>includes:</p> <ul style="list-style-type: none"> • normal operating procedures and rules (including clear documentation and definition of process inputs in the DSA allowance); • 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.
peak particle velocity (ppv)	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).
receiving environment in relation to an activity that causes or may cause environmental harm	<p>the part of the environment to which the harm is, or may be, caused. The receiving environment includes (but is not limited to):</p> <ul style="list-style-type: none"> • a watercourse; • groundwater; and • an area of land.
receiving waters	the waters into which this environmental authority authorises releases of mine affected water.

Register of Regulated Dams

includes:

- Date of entry in the register;
- Name of the dam, its purpose and intended/actual contents;
- The consequence category of the dam as assessed using the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)*;
- Dates, names, and reference for the design plan plus dates, names, and reference numbers of all document(s) lodged as part of a design plan for the dam;
- Name and qualifications of the suitably qualified and experienced person who certified the design plan and as constructed drawings;
- For the regulated dam, other than in relation to any levees –
 - The dimensions (metres) and surface area (hectares) of the dam measured at the footprint of the dam;
 - Coordinates (latitude and longitude in GDA94) within five metres at any point from the outside of the dam including its storage area
 - Dam crest volume (megalitres);
 - Spillway crest level (metres AHD).
 - Maximum operating level (metres AHD);
 - Storage rating table of stored volume versus level (metres AHD);
 - Design storage allowance (megalitres) and associated level of the dam (metres AHD);
 - Mandatory reporting level (metres AHD);
- The design plan title and reference relevant to the dam;
- The date construction was certified as compliant with the design plan;
- The name and details of the suitably qualified and experienced person who certified that the constructed dam was compliant with the design plan;
- Details of the composition and construction of any liner;
- The system for the detection of any leakage through the floor and sides of the dam;
- 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;
- Dates when recommendations and actions arising from the annual inspection were provided to the administering authority;
- Dam water quality as obtained from any monitoring required under this authority as at 1 November of each year.

rehabilitation

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

release event

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

RL

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

representative	a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the mining activities.
regulated dam	any dam in the significant or high consequence category as assessed using the <i>Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635)</i> published by the administering authority.
regulated structure	includes land-based containment structures, levees, bunds and voids, but not a tank or container designed and constructed to an Australian Standard that deals with strength and structural integrity.
residual drilling material	waste drilling materials including muds and cuttings or cement returns from well holes and which have been left behind after the drilling fluids are pumped out.
saline drainage	the movement of waters, contaminated with salts, as a result of the mining activity.
sensitive place	<ul style="list-style-type: none"> • a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or • a motel, hotel or hostel; or • an educational institution; or • a medical centre or hospital; or • a protected area under the <i>Nature Conservation Act 1992</i>, the <i>Marine Parks Act 1992</i> or a World Heritage Area; or • a public park or gardens.
Structure	dam or levee.
Spillway	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.
suitably qualified and experienced person in relation to regulated structures	<p>a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the <i>Professional Engineers Act 2002</i>, and has demonstrated competency and relevant experience:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
system design plan	a plan that manages an integrated containment system that shares the required DSA and/or ESS volume across the integrated containment system.
the Act	the <i>Environmental Protection Act 1994</i> .
µS/cm	microsiemens per centimetre.
void	any constructed, open excavation in the ground.
watercourse	has the meaning in Schedule 4 of the <i>Environmental Protection Act 1994</i> and means a river, creek or stream in which water flows permanently or intermittently—

	<ul style="list-style-type: none"> • in a natural channel, whether artificially improved or not; or • in an artificial channel that has changed the course of the watercourse. <p>watercourse includes the bed and banks and any other element of a river, creek or stream confining or containing water.</p>
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 quality	the chemical, physical and biological condition of water.
Water year	the 12-month period from 1 July to 30 June.
Wet season	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.

Appendix 3. Coordinator-General's recommended conditions

This appendix includes recommendations, made under section 52 of the SDPWO Act. The recommendations relate to the applications for development approvals for the project.

While the recommendations guide the assessment managers in assessing the development applications, they do not limit their ability to seek additional information nor power to impose conditions on any development approval required for the project.

Schedule 1. Approvals under the *Environment Protection and Biodiversity Conservation Act 1994*

It is recommended that the Commonwealth consider the following recommended conditions of approval in addition to the State's conditions listed in appendices 1 and 2.

Condition 1. Disturbance limits

To protect EPBC Act listed threatened species and communities within the project area, the maximum disturbance limits as listed in the table below apply to the project. The approval holder must not exceed these maximum disturbance limits.

Table 1 – MNES maximum disturbance limits

TECs	Maximum disturbance limits (ha)
Blue-grass-dominant grasslands of the Brigalow Belt Bioregions (North and South)	40.1
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	24.6
Threatened species	Maximum disturbance limits (ha)
Belson's panic (<i>Homopholis belsonii</i>)	70.8

Condition 2. MNES Management Plan

- (a) To mitigate impacts to EPBC Act listed threatened species and communities arising from the project, the approval holder must develop an MNES Management Plan (MMP) for the management of MNES species and communities that have been confirmed at the project site or that may be located at the project area.
The MMP must be submitted to the Minister for approval at least three months prior to the commencement of project construction activities.
- (b) The MMP must be consistent with relevant recovery plans, threat abatement plans, conservation advice and any plan required under another condition of this approval and must include:
 - (i) a description of the habitat to be impacted
 - (ii) details of the potential impacts to EPBC listed species and communities for each project stage, including impacts from:
 - (A) vegetation clearing
 - (B) mine dewatering impacts
 - (C) ecological function changes to habitat, including habitat connectivity, species function and behaviour, composition and size of populations, and death or injury to individuals,

- (D) hydrological changes due to project structures
- (E) weeds and pests
- (F) road works
- (iii) measures that will be undertaken to mitigate and manage impacts resulting from the action. These measures must include:
 - (A) the implementation of measures contained in relevant guidelines, policies and plans (such as recovery plans) to determine measures specific for each species affected by the proposed action
 - (B) the use of fauna spotters prior to and during all clearing activities to ensure impacts on EPBC listed species and communities are minimised
 - (C) measures to prevent stress, injury or and mortality of EPBC listed fauna species
 - (D) measures to protect EPBC listed species and communities and their habitat located in the project area, including adjacent to cleared areas
 - (E) measures to rehabilitate all areas of EPBC listed species and communities habitat during project stages
- (iv) details of how the MMP will be updated to incorporate and address outcomes from research undertaken for EPBC listed species and communities under this approval
- (v) a monitoring program to determine the success of mitigation and management measures. The monitoring must:
 - (A) clearly set out trigger levels or criteria for assessing the success of management measures
 - (B) measure the success of the management measures against trigger levels
 - (C) outline how milestones and compliance will be reported on.
- (vi) corrective measures to be implemented if trigger levels are exceeded.
- (c) For all MNES that were confirmed at the project site or that may be located at the project area, the MMP is to describe the process for pre-clearance surveys that will be undertaken prior to construction activities relating to all project works. In the case of confirmed species, the surveys are required to understand if additional members of the species are present.
- (d) Should MNES species be located, the MMP is to indicate how the species is to be managed.
- (e) The MMP is to include process for notification of the discovery to the Department of the Environment (DE) within five business days. The proponent is required to propose how the species is to be managed and to seek advice from DE on the undertaking.
- (f) The approval holder cannot commence construction of the action until the MMP has been approved by the Minister in writing.
- (g) The approval holder must publish the MMP on their website within 10 business days from the day of receiving the Minister's approval of the MMP in writing.
- (h) The approved plan must be implemented.

Condition 3. Offsets

The approval holder must provide environmental offsets for authorised unavoidable impacts to 40.1ha of Bluegrass dominant grasslands of the Brigalow Belt Bioregions (North and South), 24.6ha of Brigalow (*Acacia harpophylla* dominant and co-dominant) and 70.8ha of Belson's

panic (*Homopholis belsonii*) in accordance with the EPBC Act Environmental Offsets Policy (October 2012).

Condition 4. Offset Management Plan

- (a) The approval holder must submit an Offset Management Plan to the Minister for approval at least 3 months prior to commencement of construction for the project.
- (b) The Offset Management Plan must be consistent with relevant Recovery Plans, threat abatement plans, conservation advice and project species management plans, including the Bluegrass Offsets Management Plan (Appendix J.8, EIS, New Acland Coal Mine Stage 3 project).
- (c) The Offset Management Plan must include:
 - (i) details of the offset areas (including maps in electronic Geographic Information System format), site descriptions, environmental values relevant to MNES, amounts of primary habitat for each EPBC listed species, connectivity with other habitat and biodiversity corridors, a rehabilitation program, and conservation and management measures for long-term protection
 - (ii) a detailed survey and description of the condition of the offset area/s prior to any management activities, including existing EPBC listed species and communities which has the potential to be restored or improved (the baseline condition)
 - (iii) details of how the offset/s have been or will be legally secured
 - (iv) a description of the potential risks to the successful implementation of the Offset Management Plan, and include details of the contingency measures that will be implemented to mitigate against these risks
 - (v) management measures for EPBC listed species and communities and EPBC listed species habitat
 - (vi) a monitoring program for the offset site/s. The monitoring program must:
 - (A) clearly set out performance indicators
 - (B) measure the success of the management measures against stated performance criteria
 - (C) include monitoring parameters, frequencies, triggers, corrective actions, timing and scope for the duration of the project approval
 - (vii) details of how the plan will be updated to incorporate and address outcomes from research undertaken for EPBC listed threatened species and communities
 - (viii) an outline of how milestones and compliance will be reported
 - (ix) details of who will be undertaking monitoring, review, and implementation of the Offset Management Plan (if this person is not the approval holder).
- (d) The Offset Management Plan must be approved by the Minister in writing prior to the commencement of the project.
- (e) Offsets detailed in the Offset Management Plan must be legally secured within two years of commencement of the project or as required under relevant Queensland legislation, whichever is earlier.
- (f) The approved Offset Management Plan must be implemented.

Schedule 2. Approvals under the *Transport Infrastructure Act 1994*

Condition 1. Transport–general requirement

At all times and for each stage of the project, the proponent must maintain the safety, condition and efficiency of rail and state-controlled and local roads.

Condition 2. Road impact assessment and road-use management plan

- (a) To demonstrate compliance with recommendation 5: Transport general requirement, the proponent, in consultation with DTMR and TRC, must:
- (i) Finalise the road impact assessment (RIA) for each stage of the project to assess impacts on the safety, efficiency and condition of state-controlled and local roads. The RIA must:
 - (A) be developed in accordance with the DTMR Guidelines for Assessment of Road impacts of Development (2006) (GARID) and/or as required by TRC and include a completed DTMR ‘Transport Generation proforma’ detailing project-related traffic and transport generation information or as otherwise agreed in writing with DTMR and TRC
 - (B) use DTMR’s Pavement Impact Assessment tools or such other method or tools as agreed in writing with DTMR and/or TRC
 - (C) clearly indicate where detailed estimates are not available and document the assumptions and methodologies that have been previously agreed in writing with DTMR and relevant LGA, prior to RIA finalisation
 - (D) identify and detail the final impact mitigation proposals, specifically:
 - (1) A T-intersection located at the proposed New Acland Stage 3 mine infrastructure access (MIA) road/Oakey-Cooyar Road designed and constructed in accordance with DTMR’s *Road Planning Design Manual, Chapter 13: Intersections at grade*. (Note: Oakey-Cooyar Road (No 417) may also be known locally as Peachey–Maclagan Road.)
 - (2) Acland–Sabine Road/Oakey-Cooyar Road will require signage to be erected in accordance with DTMR’s Manual of uniform traffic control devices (MUTCD).
 - (3) the proposed road closure at Acland-Silverleigh Road between Oakey–Cooyar Road and the eastern boundary of Acland town will require the road boundary and existing road surface be scarified and returned to its natural state and a table drain constructed in accordance with DTMR’s Road Planning Design Manual.
 - (4) subject to the proposed realignment of Jondaryan-Muldu Road around the mining lease area being approved, alternate access for light vehicles travelling south from Acland to Jondaryan is to be delivered prior to the partial closure of the section of Jondaryan-Muldu Road that traverses the stage 3 mine lease area.
 - (5) This access is to be, at a minimum, spray sealed in accordance with Pavement Structural Design specifications of the Ausroads standard.
 - (E) be approved in writing by DTMR and TRC no later than six (6) months prior to the commencement of significant construction works, or as otherwise agreed between the proponent, DTMR and TRC.

Condition 3. Road-use management plan (RMP)

- (a) Prepare a road-use management plan (RMP) to deal with each stage of the project. The RMP must:
 - (i) be developed in accordance with DTMR's Guide to Preparing a Road-use Management Plan and/or as required by TRC, with a view to also optimising project logistics and minimising road-based trips on all state-controlled and local roads;
 - (ii) include a table listing RMP commitments and provide confirmation that all works and road-use management strategies have been designed and/or will be undertaken in accordance with all relevant DTMR standards, manuals and practices and/or as required by TRC; and
 - (iii) be approved in writing by DTMR and TRC no later than six (6) months prior to the commencement of significant construction works, or as otherwise agreed between the proponent, DTMR and TRC.

Condition 4. Upgrades and required works

- (a) Prior to the commencement of significant project-related construction works, the proponent must:
 - (i) upgrade any necessary intersection/accesses and undertake any other required works in State-controlled and/or LGA road reserves, in accordance with the current and/or LGA road planning and design policies, principles and manuals, unless otherwise agreed in writing with the DTMR Downs South West Regional Office and/or TRC;
 - (ii) prior to undertaking any of these works and as required above, obtain the relevant licences and permits, for example, under the *Transport Infrastructure Act (Qld) 1994* for works and project facilities/infrastructure within the state-controlled road corridor; and
 - (iii) undertake any required works and other impact mitigation strategies as required by the RIA and RMP, in accordance with latest relevant DTMR and TRC policies and standards at the time of approval or agreement, prior to commencement of significant construction works unless otherwise agree to in writing by DTMR and TRC.

Condition 5. Rail and road transport of coal and dust emissions

- (a) In relation to road and rail transport of coal and managing coal dust emissions, the proponent must:
 - (i) prepare a Coal Dust Management Plan comprising two parts, identifying control measures to mitigate the emission of dust from loaded and unloaded coal haulage trains (Part 1) and from vehicles during haulage of New Acland coal on public roads (Part 2);
 - (ii) in Part 1 when the proponent is transporting coal via Queensland Rail's South West Rail System or alternate rail systems, the proponent will comply with commitments stated in the South West System Coal Dust Management Plan (2013) including the use of coal surface veneering on loaded coal wagons, and
 - (iii) in Part 2 (covering haulage of New Acland coal on public roads), the Coal Dust Management Plan must be in accordance with the Department of Transport and Main Roads Smart Practice Guide: Load containment requirements for haulage of coal on Queensland public roads (2014), and include measures to effectively

manage coal dust emissions and the safety of other road users while loading and hauling coal on public roads.

- (iv) The Coal Dust Management Plan is to be provided to the DTMR for review and comment no later than three months prior to the project's operations phase.

Condition 6. Road permits, approvals and traffic management plans

- (a) To ensure efficient processing of the project's required transport-related permits and approvals, the proponent should, no later than three (3) months, or such other period agreed in writing with DTMR and/or TRC, prior to the commencement of significant construction works or project-related traffic:
 - (i) submit detailed drawings of any works required to mitigate the impacts of project-related traffic for DTMR and TRC's review and approval
 - (ii) obtain all relevant licences and permits required under the *Transport Infrastructure Act 1994* for works within the state-controlled road corridor (s.33 for road works approval, s.62 for approval of location of vehicular accesses to state roads and s.50 for any structures or activities to be located or carried out in a state-controlled road corridor).
 - (iii) prepare a Heavy Vehicle Haulage Management Plan for any excess mass or over-dimensional loads for all phases of the project in consultation with DTMR's Heavy Vehicles Road Operation Program Office, the Queensland Police Service and TRC.
 - (iv) prepare Traffic Management Plan/s (TMP) in accordance with DTMR's Guide to preparing a Traffic Management Plan and/or as required by TRC. A TMP must be prepared and implemented during the construction and commissioning of each site where road works are to be undertaken, including site access points, road intersections or other works undertaken in the state-controlled road corridor.

Condition 7. Completing required road works before commencement of significant project traffic

- (a) In accordance with timeframes stated above, the proponent must, prior to the commencement of any significant project-related construction traffic, complete the required works/ make contributions towards works as required, unless otherwise agreed in writing with the DTMR Downs South West Regional Office:
 - (i) Upgrade any necessary intersection/accesses and undertake any other required works in accordance with the current road planning and design policies, principles and manuals, unless otherwise agreed in writing with the Downs South West Regional Office,
 - (ii) Construct any required road works before commencement of project-related construction traffic.
 - (iii) Implement the approved Traffic Management Plan when undertaking any works during construction and commissioning of the above mentioned intersection upgrade.

Condition 8. Queensland Rail permits, approvals and advice

- (a) For the proposed rail spur and balloon loop, the proponent is required to gain approval under section 55 of the *Transport (Rail Safety) Act 2010*. The organisation that will have effective management and control of the construction will need to be registered if the infrastructure is classified as a private siding.

- (b) The proponent will require rail crossing approval from DTMR under section 255 of the *Transport Infrastructure Act 1994* where changes to rail crossings or new rail crossings are proposed.
- (c) The applicant must provide an ALCAM (Australian Level Crossing Assessment Model) assessment for proposed open level crossing or proposed changes. The ALCAM assessment must address the following:
 - (i) current and existing traffic flow and train movements;
 - (ii) expected future traffic flow; and
 - (iii) mitigation measures to address any issues identified in the ALCAM assessment.
- (d) Before work commences on constructing the spur line and balloon loop, the proponent must have an effective management and control of the construction. Contact Rail Regulation Unit as per details in the header for further advice. The organisation will need to be registered as a minimum (if the infrastructure is classified as a private siding) and may potentially require rail safety accreditation as rail infrastructure manager.
- (e) Operation of rollingstock on a private siding requires accreditation as a rail transport operator (rollingstock operator) and will require endorsement from DTMR under s39 of the *Transport (Rail Safety) Act 2010*.

The Department of Transport and Main Roads has jurisdiction for recommended conditions 1-8 inclusive.

Schedule 3. Approvals under the *Water Act 2000*

Condition 1. Water security

- (a) In accordance with relevant conditions of the Environmental Authority, the proponent must collect data that identifies natural groundwater level trends for identification of water level impact to authorised water users from the mining operation on authorised water users.
- (b) Within 2 years following the granting of the mining lease/s for the New Acland Coal Mine Stage 3 project, the proponent must provide a report to each potentially unduly affected authorised water user and the administering authority. The report must include a summary of the collected baseline information and address potential impacts to the groundwater supplies of those users.
- (c) In the report required by condition (b), the proponent must:
 - (i) Identify operational bores for each potentially affected authorised water user
 - (ii) For each operational bore:
 - (A) Identify natural groundwater levels and water quality;
 - (B) Identify the condition and supply capacity of the bore;
 - (C) Identify the operational requirements and current use of the bore;
 - (D) Clearly outline the predicted decrease in water level at the bore due to proposed mining operations;
 - (E) Provide an initial assessment of the likely water supply impacts to the affected authorised water users, and timing of those impacts, during and following the project activity;
 - (F) Outline of the potential future actions (make good measures) which would ensure the potentially affected authorised water users will have access to a reasonable quantity and quality of water for the authorised use and purpose of the bore/s.

- (d) The proponent must enter into agreement with all potentially 'unduly affected' water users (as defined in conditions of the water licence or relevant legislation at the time) about the make good measures outlined in condition (c), or other negotiated arrangement.
- (e) If, after advice from the parties that agreement pursuant to condition d) cannot be reached, and in the opinion of the responsible Chief Executive all reasonable attempts have been made to achieve agreement, then the relevant administering authority may, in consultation with the licensee and the unduly affected water user, determine the make good measures to be taken pursuant to the relevant legislative instrument at the time.
- (f) The agreement must be entered into, at least 3 years prior to the time an 'unduly affected' water user is predicted to become 'unduly affected' due to dewatering operations (based on the latest version of the Acland Coal project numerical groundwater model at the time).

DNRM is to have jurisdiction for this recommended condition.

Condition 2. General requirements—Commonwealth Basin Plan aquifers Oakey Creek Alluvial aquifer

- (a) Following collection and analysis of groundwater monitoring data obtained from monitoring bores in the Walloon Coal Measures and Oakey Creek Alluvium (pursuant to relevant conditions of the Environmental Authority) and as a component of the 2nd and subsequent reviews of the New Acland Coal numerical groundwater model pursuant to relevant conditions of the Environmental Authority, the proponent must present a peer reviewed report outlining the impact on the Oakey Creek Alluvial aquifer for approval by the relevant administering authority. The report must:
 - (i) Establish any identified impact associated with mining activities, if any, on the Oakey Creek Alluvial aquifer
 - (ii) Include an assessment of natural and potential pumping based water level variation caused by non mining authorised users, in the Oakey Creek Alluvial aquifer
 - (iii) Outline any requirements for additional modelling or monitoring required
 - (iv) If the investigation under Condition a) concludes that there is an identified impact on the Oakey Creek Alluvial aquifer as a result of mining activities, the proponent must determine the volumetric impact associated with the identified impact.
 - (v) If the impact is determined to be the result of mining activities, the proponent may be required to construct additional monitoring bores. Additional monitoring bores are to be incorporated in the Groundwater Monitoring and Management Plan pursuant to the environmental authority for the New Acland Coal Mine Stage 3 project and obtain any necessary authorities as a result.
 - (vi) The proponent must offset any take of water from the Oakey Creek Alluvial aquifer identified in accordance with the above condition as determined by the relevant administrative authority.

DNRM is to have jurisdiction for this recommended condition.

Condition 3. Main Range Volcanics aquifer

- (a) The proponent must determine the long term volumetric impact of the take of water from the Main Range Volcanics aquifer and incorporate this into the 2nd review of the New Acland Coal numerical groundwater model pursuant to conditions 10-12 of Appendix 1.
- (b) The proponent must offset any long term take of water from the Main Range Volcanics aquifer as determined by the administering authority for the *Water Act 2000*.

DNRM is to have jurisdiction for this recommended condition.

Schedule 4. Proponent commitments

Recommendation 1. Commitments

The proponent is required to undertake the New Acland Coal Mine Stage 3 project in line with commitments made in Appendix D: Commitments register, AEIS (August 2014), New Acland Coal Mine Stage 3 project.

Acronyms and abbreviations

Acronym	Definition
$\mu\text{g}/\text{m}^3$	micrograms per cubic metre
$\mu\text{S}/\text{cm}$	microsiemens per centimetre
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i> (Qld)
AEIS	additional information to the EIS
AHD	Australian Height Datum
AEP	Annual Exceedance Probability
AHMP	aviation hazard management plan
Al	aluminium
ALCAM	Australian Level Crossing Assessment Model
AMP	Acland Management Plan
ANZECC	Australian and New Zealand Environment Conservation Council
APC	Acland Pastoral Company
AQMP	Air Quality Management Plan
As	Arsenic
AS/NZS	Australian Standard/New Zealand Standard
AWQG	<i>Australian Water Quality Guidelines</i>
BDG	Bluegrass (<i>Dichanthium spp.</i>) dominant grasslands of the Brigalow Belt bioregions (north and south)
BOMP	Bluegrass Offset Management Plan
Ca	calcium
CDMP	coal dust management plan
CHMP	cultural heritage management plan
CHPP	Coal Handling Preparation Plant
CIS	community investment strategy
Cl	chloride
$\text{CO}_2\text{-e}$	carbon dioxide equivalent
Cu	copper
Cwlth	Commonwealth
CZMP	Conservation Zone Management Plan
DAFF	Department of Agriculture, Fisheries and Forestry
dB(A)	decibels measured at the 'A' frequency weighting network
DE	Commonwealth Department of the Environment
DEHP	the former Department of Environment and Heritage Protection (now DE)
DNRM	Department of Natural Resources and Mines
DO	dissolved oxygen
DoS	degree of saturation
DSA	Design Storage Allowance
DSDIP	Department of State Development, Infrastructure and Planning

Acronym	Definition
DSITIA	Department of Science, Information Technology Innovation and the Arts
DTMR	Department of Transport and Main Roads (Qld)
EA	environmental authority
EC	electrical conductivity
EIS	environmental impact statement
EM Plan	environmental management plan
EOS	environmental offset strategy
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPC	exploration permit for coal
EPP	Environmental Protection Policy (water, air, waste, noise)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
EPP (Water)	Environmental Protection (Water) Policy 2009
ERA	environmentally relevant activity
EVNT	endangered, vulnerable and near-threatened species
F	fluorine
Fe	iron
FLURP	Final Land Use Rehabilitation Plan
GAB	Great Artesian Basin
GARID	DTMR's <i>Guidelines for Assessment of Road Impacts of Development</i>
GDE	groundwater-dependent ecosystem
GHFF	grey-headed flying-fox
GHG	greenhouse gas
GMIMP	Groundwater Monitoring and Impact Management Plan
GPS	global positioning system
ha	hectares
HCO ₃	bicarbonate
IAS	initial advice statement
ICH	Indigenous cultural heritage
IESC	Independent Expert Scientific Community
ITSF	In-pit Tailings Storage Facility
JRLF	Jondaryan Rail Load-out Facility
K	potassium
kPa	kilopascal
km	kilometres
KSMP	Koala Species Management Plan
kV	kilovolt
L _{Aeq}	the average A-weighted sound pressure level of a continuous steady sound

Acronym	Definition
	that has the same mean square sound pressure as a sound level that varies with time
L _{Amax}	the maximum average A-weighted sound pressure measured over a specified period of time
LAN,T	statistical descriptor for the variation of noise
LoS	levels of service
LP Act	<i>Land Protection (Pest and Stock Route Management) Act 2002 (Qld)</i>
m	metre
m/s	metre per second
MAW	mine-affected water
max L _{PZ,15 min}	the maximum value of the Z-weighted sound pressure level measured over 15 minutes
Mbcm	million bank cubic metres
mBGL	metre below ground level
Mg	magnesium
mg/L	milligrams per litre of liquid
mg/m ²	milligrams per square metre
MHF	materials handling facility
MIA	mining infrastructure area
ML	megalitres /
MLA	mining lease application /
MMP	MNES Management Plan
Mn	manganese
MNES	matters of national environmental significance
MR Act	<i>Mineral Resources Act 1989 (Qld)</i>
MRL	Mandatory Reporting Level
Mt	million tonnes
Mtpa	million tonnes per annum
MSES	matters of state environmental significance
N	nitrogen
Na	sodium
NAC	New Acland Coal
NAF	non-acid forming
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NGER Act	<i>National Greenhouse and Energy Reporting Act 2007 (Cwlth)</i>
NICH	non-Indigenous cultural heritage
NVMP	Noise and Vibration Management Plan
PAF	potentially acid forming
PALU	priority area land use
pH	acidity/alkalinity

Acronym	Definition
PM ₁₀	particulate matter with equivalent aerodynamic diameter less than 10µm
PM _{2.5}	particulate matter with equivalent aerodynamic diameter less than 2.5µm
PMF	probable maximum flood
PWMP	Pest and Weed Management Plan
QGN 20v3	<i>Queensland Guidance Note QGN 20 v3: Management of oxides of nitrogen in open cut blasting</i>
QH Act	<i>Queensland Heritage Act 1992 (Qld)</i>
QLUMP	Queensland Land Use Mapping Program
QRC Code	Queensland Resources and Energy Sector Code of Practice for Local Content 2013
RE	regional ecosystem
RIA	road impact assessment
RIDA	Regional Interests Development Approval
RMP	road-use management plan
ROM	run-of-mine
RPEQ	Registered Professional Engineer of Queensland
RPI Act	<i>Regional Planning Interests Act 2012 (Qld)</i>
RUSLE	Revised Universal Soil Loss Equation
SCL	strategic cropping land
SCR	state-controlled road
SDL	Sustainable Diversion Limits
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SDWPO Regulation	State Development and Public Works Organisation Regulation (Qld)
Se	selenium
SEVT	semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions
SIA	social impact assessment
SIMR	social impact management report
SO ₄	Sulphate
SPA	<i>Sustainable Planning Act 2009 (Qld)</i>
SPP	state planning policy
SR	sensitive receptor
STP	sewage treatment plant
SWL	standing water level
TARP	Trigger Action Response Plan
TDS	total dissolved solids
TEC	threatened ecological communities
TEOM	Tapered Element Oscillating Microbalance
TI Act	<i>Transport Infrastructure Act 1994 (Qld)</i>

Acronym	Definition
TLF	train load-out facility
TMP	traffic management plan
TOR	terms of reference
tpa	tonnes per annum
TRC	Toowoomba Regional Council
TSP	total suspended particles
TSTP	Threatened Species Translocation Plan
VM Act	<i>Vegetation Management Act 1999</i> (Qld)
WCM	Walloon Coal Measures
WMAP	Workforce Management Action Plan
WMP	waste management plan
WQO	water quality objective
WRMP	Water Resource Management Plan
WWRF	Wetalla Wastewater Reclamation Facility

Glossary

Term	Definition
assessment manager	For an application for a development approval, means the assessment manager under the <i>Sustainable Planning Act 2009</i> (Qld).
bilateral agreement	The agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Commonwealth Minister for the Environment to rely on specified environmental impact assessment processes of the state of Queensland in assessing actions under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
construction areas	The construction worksites, construction car parks, and any areas licensed for construction or on which construction works are carried out.
controlled action	A proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth).
controlling provision	The matters of national environmental significance, under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth), that the proposed action may have a significant impact on.
coordinated project	A project declared as a 'coordinated project' under section 26 of the SDPWO Act. Formerly referred to as a 'significant project'.
Coordinator-General	The corporation sole constituted under section 8A of the <i>State Development and Public Works Organisation Act 1938</i> and preserved, continued in existence and constituted under section 8 of the SDPWO Act.
environment	As defined in Schedule 2 of the SDPWO Act, includes: a) ecosystems and their constituent parts, including people and communities b) all natural and physical resources c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
environmentally relevant activity (ERA)	An activity that has the potential to release contaminants into the environment. Environmentally relevant activities are defined in Part 3, section 18 of the <i>Environmental Protection Act 1994</i> (Qld).

imposed condition	A condition imposed by the Queensland Coordinator-General under section 54B of the SDPWO Act. The Coordinator-General may nominate an entity that is to have jurisdiction for the condition.
initial advice statement (IAS)	<p>A scoping document, prepared by a proponent, that the Coordinator-General considers in declaring a coordinated project under Part 4 of the SDPWO Act. An IAS provides information about:</p> <ul style="list-style-type: none"> • the proposed development • the current environment in the vicinity of the proposed project location • the anticipated effects of the proposed development on the existing environment <p>possible measures to mitigate adverse effects.</p>
matters of national environmental significance	<p>The matters of national environmental significance protected under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. The eight matters are:</p> <ol style="list-style-type: none"> a) world heritage properties b) national heritage places c) wetlands of international importance (listed under the Ramsar Convention) d) listed threatened species and ecological communities e) migratory species protected under international agreements f) Commonwealth marine areas g) the Great Barrier Reef Marine Park <p>nuclear actions (including uranium mines).</p>
nominated entity (for an imposed condition for undertaking a project)	An entity nominated for the condition, under section 54B(3) of the SDPWO Act.
proponent	The entity or person who proposes a coordinated project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project.

stated condition	<p>Conditions stated (but not enforced by) the Coordinator-General under sections 39, 45, 47C, 49, 49B and 49E of the SDPWO Act. The Coordinator-General may state conditions that must be attached to a:</p> <ul style="list-style-type: none"> • development approval under the <i>Sustainable Planning Act 2009</i> • proposed mining lease under the <i>Mineral Resources Act 1989</i> • draft environmental authority (mining lease) under Chapter 5 of the <i>Environmental Protection Act 1994</i> (EPA) • proposed petroleum lease, pipeline licence or petroleum facility licence under the <i>Petroleum and Gas (Production and Safety) Act 2004</i> <p>non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.</p>
works	<p>Defined under the SDPWO Act as the whole and every part of any work, project, service, utility, undertaking or function that:</p> <ul style="list-style-type: none"> h) the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body is or may be authorised under any Act to undertake, or i) is or has been (before or after the date of commencement of this Act) undertaken by the Crown, the Coordinator-General or other person or body who represents the Crown, or any local body under any Act, or <p>is included or is proposed to be included by the Coordinator-General as works in a program of works, or that is classified by the holder of the office of Coordinator-General as works.</p>

The Coordinator-General

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