The Coordinator-General

Kevin's Corner project:

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

May 2013

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Queensland Government

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Synopsis

This report provides an evaluation of the potential impacts of the Kevin's Corner project (the project). It has been prepared pursuant to section 35 of the *State Development Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The proponent, Hancock Galilee Pty Ltd, proposes to construct a 30 million tonnes per annum open-cut and underground thermal coal mine, 65 kilometres (km) north-west of the Alpha township in Central Queensland. The mine is located in the Galilee Basin and is situated within the Barcaldine Regional Council (BRC) local government area.

The project, which would require a A$4.2 billion investment, also includes the development of a 17.8 km rail spur, an airport and associated mining infrastructure. The project would rely on the railway infrastructure of the Alpha Coal project to transport coal to the Port of Abbot Point, Bowen.

The project is expected to create approximately 1800 jobs during the construction phase and 1600 jobs during the operational phase. It contributes to a key Queensland Government objective of realising the timely development of the Galilee Basin, while ensuring net community benefits and environmental objectives are maximised. It is dependent on the development of rail, port and electricity transmission infrastructure proposed to be developed by third parties to support the expansion of the Galilee Basin.

In undertaking my evaluation of the environmental impact statement (EIS), I have considered the EIS, issues raised in submissions, the supplementary EIS (SEIS), additional information provided by the proponent and advice I have received from State agencies, BRC and the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC).

The following provides an overview of the main issues arising from my evaluation.

Mine dewatering—groundwater security and the Great Artesian Basin

Mining would occur below the regional water table and it would be necessary to conduct dewatering (i.e. remove groundwater) in order for mining to occur safely for the project. This may result in impacts on the groundwater security of existing landowners and the Great Artesian Basin (GAB). The proponent used a refined predictive groundwater model, calibrated using both steady state and transient data, to provide the best estimate possible of groundwater drawdown for the project, and also the cumulative groundwater drawdown for the Kevin's Corner project and adjacent Alpha Coal project which would also require mine dewatering.

Groundwater security

The main groundwater resources in the mining lease area are associated with the Permian Sandstone (Bandanna Formation and Colinlea Sandstone) and to a lesser extent the coal seams. Groundwater within the vicinity of the project is used for domestic and stock watering purposes.

Cumulative drawdown predictions (of the Kevin's Corner and Alpha Coal projects) identify a total of 28 landholder bores to be potentially 'at risk' of mine dewatering. Long-term (post-mining) predictions indicate that groundwater levels would not recover to pre-mining levels

adjacent to the project, thus the groundwater resources would be 'mined' from the Permian Sandstone and permanently lost.

The proponent has made a commitment to 'make good' all impacts (including the cumulative impacts of the Kevin's Corner and Alpha Coal projects) on landowner water supplies, and has already commenced negotiations with affected landowners. The proponent's 'make good' provisions would be addressed in detail as part of conditions attached to any approval for a licence under the *Water Act 2000,* including:

- existing water supplies to be protected
- unduly affected water supplies to be restored
- agreements with bore owners on appropriate restoration measures (including the licensee bearing the cost of restoration measures)
- urgent restoration, monitoring and assessment, reporting and mine closure requirements.

Nevertheless, to ensure that local landholders are compensated appropriately for any impacts caused by mine dewatering, I have recommended that, prior to the commencement of mining activities, the proponent must develop to the satisfaction of the Department of Natural Resources and Mines (DNRM) a plan to ensure the long-term security of water for all current groundwater users predicted to be affected by the project (refer to Appendix 4).

Great Artesian Basin

The project mine footprint does not extend far enough west to intercept the closest GAB aquifer (the Clematis Sandstone). Therefore, potential impacts on the GAB could only arise from groundwater draining via geological fault structures from the Clematis Sandstone through the Rewan Formation into the aquifers of the Bandanna Formation and Colinlea Sandstone.

The proponent's site surveys identified no significant faulting or displacement of coal seams that could promote inter-aquifer or inter-basin hydraulic connection. Some minor faults were identified; however these faults have no identifiable connection to the Rewan Formation. Based on advice from DNRM that, on the balance of information available, faulting of the Rewan Formation is not evident in the vicinity of the project, and the proponent's comprehensive assessment of groundwater impacts, I am satisfied that the project is unlikely to impact the GAB aquifers or the threatened ecological communities reliant on GAB springs.

As a precautionary approach and based on advice from DNRM, in order to identify any unforseen impacts that may be caused by the mining operations I have made recommendations (Appendix 4) regarding the monitoring of groundwater levels in the Rewan Formation and Clematis Sandstone (nearest GAB aquifer) and the development of appropriate trigger levels for the early detection of induced flow.

Groundwater quality—subsidence and mine waste management

The project may result in impacts on groundwater quality through increased aquifer connectivity from subsidence and the management of mine waste.

Subsidence and increased aquifer connectivity

Mine dewatering would reduce this potential impact as the composite groundwater would be used on site and would not result in aquifer through-flow from the site. Predictive post-mining

modelling results indicate that groundwater would flow towards the final void at the adjacent Alpha Coal Mine and not into regional aquifers or surface water systems. Further, site investigations show groundwater in the units overlying the targeted coal seams occurs as sporadic unconfined perched groundwater, and the units are not regarded as significant regional aquifers.

I have stated draft Environmental Authority (EA) conditions (Appendix 1, Schedule C) requiring the monitoring of groundwater hydrochemistry of underlying aquifers for comparison with contaminant trigger values. If groundwater quality characteristics exceed any of the stated trigger values, the proponent must investigate the potential for environmental harm. The Department of Environment and Heritage Protection (DEHP) advises it will respond to any non-compliance of EA conditions or unauthorised environmental harm and has the ability to use a number of enforcement measures in accordance with DEHP's Enforcement Guidelines.

Mine waste management

Mine waste generated from the project may also result in potential groundwater quality impacts. The proponent's geochemical assessment of coal and mining waste materials associated with the Kevin's Corner project indicates that the bulk overburden/interburden material is Non-Acid Forming (NAF) and has a high factor of safety with respect to potential acid generation.

To protect water resources, I have stated a number of draft EA conditions to ensure the effective assessment and management of mining waste (Appendix 1, Schedule F). A detailed mining waste assessment program will be required for the progressive characterisation of all mining waste prior to disposal, including for net acid producing potential, salinity, physical properties and a number of key contaminants.

A Mining Waste Management Plan must be developed and implemented prior to the commencement of mining activities and reviewed and reported on each calendar year to support the ongoing adaptive management program for the project. Mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste (waste rock, spoil, overburden, tailings and course reject material) is appropriately confined and contained prior to decommissioning and rehabilitation. In addition, the disposal of all potentially acid forming coarse reject waste must be encapsulated with NAF mining waste and disposed in a manner such that the coarse reject waste would not cause significant harm to the environment for the foreseeable future.

Flooding

The Kevin's Corner project and adjacent Alpha Coal project involve a number of creek diversions and flood levels which may result in cumulative flooding impacts. The proponent's cumulative assessment of both projects determined that, with the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, there would be no significant change in the area of flooding or duration when compared to the modelled baseline scenario.

Modelling has shown a minor reduction in the area flooded for greater than 96 hours compared to the baseline scenario. Given the reduction is minor in scale and applies only to major flood events, I do not consider it likely that changes in hydrology would result in

adverse impacts on protected species or habitats beyond the impacts caused directly from the construction of the mine pits and associated infrastructure.

I have stated a number of draft EA conditions to protect surface water values, including conditions to ensure regulated structures (i.e. dams, levees and diversions) can accommodate extreme events.

Surface water quality

The Kevin′s Corner project would involve the capture of 33.94 km^2 of catchment within the mine water management system. The proponent has designed the mine water management system to mitigate the likelihood of uncontrolled water releases and prevent the mine from impacting on surface water quality. In the event of an extreme flood event, excess water would be directed into internal receiving structures such as the open-cut pits and mine water dams.

DEHP has advised that the proponent's assessment documentation provides an adequate assessment of potential surface water quality impacts. The Department of Science, Information Technology, Innovation and the Arts (DSITIA) has reviewed the proponent's water release strategy which has been developed in accordance with the stated draft EA conditions (refer to Appendix 1). DSITIA concurs that the strategy would ensure the protection of environmental values of receiving waters in accordance with the Environmental Protection (Water) Policy 2009 and relevant guidelines that provide water quality objectives to protect these values.

I have stated a number of draft EA conditions in order to protect surface water quality values (Appendix 1, Schedule C), including conditions which set receiving environment monitoring and contaminant trigger levels at upstream and downstream monitoring locations. If quality characteristics of the receiving water at the downstream monitoring points exceed any specified trigger level during a release event, the proponent must compare the downstream results to upstream results in the receiving waters. In the event that exceedences are identified, the proponent must investigate the potential for environmental harm, including actions taken to prevent environmental harm.

Cumulative impacts to regional water resources

Potential future projects in the vicinity of the Kevin's Corner project include the Alpha Coal Project (Hancock Coal Pty Ltd), Galilee Coal Project (Waratah Coal Pty Ltd) and South Galilee Coal project (AMCI Pty Ltd). If these proposed projects all proceed, it is anticipated that tributaries to the Burdekin Catchment would be dissected by mines along a coal strike of approximately 100 km.

Mining activities for the Kevin's Corner project can only proceed on the proposed mining lease in accordance with an EA issued under the EP Act. The authority sets conditions that must be complied with to protect the environment. However, the EA can only apply to activities on the mining lease and does not regulate the potential cumulative impacts arising from multiple mining activities in the Galilee Basin.

DEHP has noted that, in light of the multiple mines proposed for the Galilee Basin, it would be preferable to establish a regional surface water monitoring and reporting program similar to that operating in the Bowen Basin.

Advice received from the Independent Expert Scientific Committee for Coal Seam Gas and Large Coal Mining Development (IESC) also recommended the development of a regional water balance model (RWBM) and the risk-based assessment of cumulative impacts. This work goes beyond individual proponent responsibility, and I consider this should be the responsibility of the State Government as part of its responsibility for overall management of water resources in the region.

Accordingly, to address potential cumulative impacts on water resources in the Belyando-Suttor sub-catchment and the aquifers of the eastern part of the Galilee Basin[1], I have recommended that the state government develop a RWBM, local water quality objectives and a basin-wide monitoring and assessment program (refer to Appendix 4). This program will collate water monitoring data recorded by proponents and provide for the risk-based assessment of regional cumulative impacts on existing water users, aquatic habitat loss and impacts on ecological systems. Regional cumulative impacts will include the impacts of proposed mining project activities, including but not limited to; open-cut and underground mining operations, mine dewatering, mine waste management, stream diversions and flood levees and subsidence.

I have also imposed a condition on the proponent to ensure adequate proponent contribution towards funding the management of cumulative impacts (Appendix 3). I will determine a reasonable apportionment of funding sources in consultation with relevant state agencies and relevant Galilee Basin project proponents.

Biodiversity

Land clearance

A total of 3839 ha of state significant biodiversity value[2] (SSBV) vegetation—a combination of a number of state biodiversity values including watercourse vegetation, of concern Regional Ecosystems (REs) and protected fauna habitat—would be cleared across the project area. This includes 2834 ha of high-value habitat for species protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that are matters of national environmental significance (MNES).

Vegetation clearing would predominantly occur during the first five years of the project as part of site establishment and open-cut operations. The environmental management plans (EMPs) for the project outline a number of measures in order to mitigate the impacts of vegetation clearing. The proponent's Rehabilitation Management Plan, a sub-plan of the EMP, aims to return a stable landform capable of uses similar to those prior to disturbance (a mix of bushland and low density cattle grazing land). The proposed final land forms and land use aim to link remnant vegetation where possible and return some conservation values. Offsets are proposed for the unavoidable direct clearing of remnant vegetation where it contains MNES and SSBV values.

[1] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.
[2] State Significant Biodiversity Values means the values identified in Appendix A State Significant Biodiversity Values of the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011).

Subsidence

The proponent's Interim Subsidence Management Plan (ISMP) presents the results of detailed subsidence modelling and identifies areas at risk of impact from cracking, ponding and mitigation works (including ripping cracks, pillar excavation and timber groyne construction). A total of 632 ha of SSBV vegetation is predicted to be impacted from subsidence and related impacts, including 476 ha of high-value MNES habitat.

The subsidence modelling is considered a worst-case assessment as it is based on an overburden composed wholly of rock and does not take into account the quaternary sediments which overlay much of the project area (clay rich with an average thickness of 40 m).

The ISMP mitigation measures focus on minimising the effects of cracking and ponding on watercourses. Areas of predicted permanent ponding would be drained by excavating the pillar structure to allow natural water stream flow. Other mitigation measures include crack infilling, installing erosion control devices, and retaining riparian vegetation to maintain watercourse stability.

All modelled subsidence-related impacts are proposed to be offset prior to the commencement of mining operations. Accordingly, the project would have offsets in place significantly in advance of the predicted impacts, given some of the underground mine areas would not be developed for 20–30 years.

Management and monitoring of impacts from subsidence would be a long-term process, as the impacts may not be evident for several years (due to time-lag effects and climatic/seasonal variables) and the proposed 30-year duration of underground mining. Accordingly, I consider that mitigation and restoration activities would need to be adaptive processes as the actual impacts may vary from the predicted impacts and the success of mitigation measures must also be taken into account.

The ISMP describes an ongoing adaptive management program of monitoring subsidence impacts and the effectiveness of mitigation measures over the life of the project. The proponent would document actual impacts and validate predicted subsidence-related impacts from the modelling in five-year stages. Monitoring results would be reported at the end of each five-year period with any proposed changes to management measures. I have stated conditions for the project's draft EA (Appendix 1Schedule F) in order to mandate the proponent's proposed management and monitoring program of subsidence impacts.

Based on the results of monitoring, where the actual area of disturbance is identified as greater than the modelled area of disturbance, I have conditioned (as part of the draft EA) that supplementary biodiversity offsets must be provided (Appendix 1, Schedule F).

Impacts to Cudmore Resources Reserve

Cudmore Resources Reserve (CRR), listed under Schedule 4 Resources Reserves of the Nature Conservation (Protected Areas) Regulation 1994, extends over 1673.5 ha of the north-western corner of the proposed mining lease and overlaps with the northern underground mine.

The key potential impacts on the conservation values of CRR are likely to be associated with subsidence. The ISMP predicts low potential for subsidence impacts to occur within the CRR. Water is predicted to pond following subsidence in one area, 1.1 ha in size, within this

part of the mine lease. To ensure the maintenance of stream flows in the area, an additional 2 ha of remnant vegetation would need to be cleared as a result of mitigation works in watercourse vegetation. The proponent advises that 2.7 ha of the total impact on the CRR (3.1 ha) includes vegetation that is of SSBV and would therefore be included in the proponent's offset proposal.

In accordance with the *Nature Conservation Act 1992* (NC Act), prior to the commencement of any mining activities occurring within or beneath the CRR, the proponent would need to develop an agreed CRR Operations Plan (in consultation with joint trustees of the CRR—the Department of National Parks, Recreation, Sport and Racing (DNPRSR) and DNRM)). This plan is to deal specifically with those activities proposed to occur within and beneath the CRR, including measures to mitigate predicted impacts.

Impacts to individual MNES and SSBV

No threatened ecological communities listed under the EPBC Act are predicted to be impacted by the project. Field surveys within the off-lease rail and road corridors confirmed the occurrence of 59 ha of RE 11.8.11 (*Dichanthium sericeum* grassland on Cainozoic igneous rocks), which is listed as 'of concern' under the *Vegetation Management Act 1999*. This 59-hectare area also provides potential habitat for one flora species listed as vulnerable under the EPBC Act—King blue-grass (*Dichanthium queenslandicum*)—which is therefore also predicted to be impacted by the project.

The habitat of seven threatened fauna species and three migratory bird species listed under the EPBC Act are predicted to be impacted by the project. These species, their listings under the EPBC Act and high value habitat predicted to be impacted include:

Threatened fauna species

- squatter pigeon (*Geophaps scripta scripta*) (vulnerable)—1158 ha
- yakka skink (*Egernia rugosa*) (vulnerable)—1415 ha
- Brigalow scaly-foot (*Paradelma orientalis*) (vulnerable)—1415 ha
- ornamental snake (*Denisonia maculata*) (vulnerable)—844 ha
- black-throated finch (southern) (*Poephila cincta cincta*) (endangered)—1000 ha
- koala (*Phascolarctos cinereus*) (vulnerable)—757 ha
- red goshawk (*Erythrotriorchis radiatus*) (vulnerable)—1201 ha

Migratory species

- eastern great egret (*Ardea modesta*)—762 ha
- cattle egret (*Ardea ibis*)—762 ha
- rainbow bee-eater (*Merops ornatus*)—344 ha

All threatened fauna species listed under the EPBC Act listed above are also protected under Queensland legislation (the NC Act). The high-value habitat of an additional four fauna species protected under the NC Act are predicted to be impacted, including:

- square-tailed kite (*Lophoictinia isura*) (near-threatened)—918 ha
- cotton pygmy-goose (*Nettapus coromandelianus*) (near-threatened)—617 ha
- Capricorn ctenotus (*Ctenotus capricorni*) (near-threatened)—1410 ha

- black-chinned honeyeater (*Melithreptus gularis*) (near-threatened)—1685 ha.

EMPs prepared for the project detail a number of measures to mitigate impacts on these species. In accordance with the provisions of the NC Act, the proponent must also prepare and implement species management plans (SMPs) for all fauna species for which high value habitat is predicted to be impacted by the project. SMPs would include comprehensive mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on each species. However, given the scale of the proposed mining operation there would be residual adverse impacts on some of the abovementioned species. With the exception of the squatter pigeon and migratory species, the proponent has committed to offset likely residual adverse impacts for these species.

The squatter pigeon is a highly mobile species which utilises a range of habitats and the proponent considers that the project would not have a significant impact on populations of this species in the region. Considering the migratory nature of the eastern great egret, cattle egret and rainbow bee-eater, it is likely that these migratory species would be occasional visitors rather than being dependant on the project area. In addition to this, due to the wide distribution of these species, populations that may be present on the project site are not considered to be an ecologically significant proportion of the total population. Accordingly, the proponent has proposed no offsets for these species. However, the proponent notes that the majority of habitat for these species would be provided under offsets for other species.

In May 2013, the proponent finalised the Kevin's Corner Biodiversity Offsets Plan. The offsets plan aims to address both State and Commonwealth Government offset requirements and has been prepared in accordance with the EPBC Act *Environmental Offset Policy* (October 2012) and accompanying *Offsets Assessment Guide*.

The proponent is proposing to offset up-front all predicted residual direct (vegetation clearing associated with project infrastructure) and indirect (residual impacts as a result of underground mining and subsidence) impacts on MNES and SSBV for the life of the project. The majority of the proposed offset area is located within the conservation hubs identified in the Queensland Government Galilee Basin Offset Strategy (GBOS). Conservation hubs are pre-identified properties confirmed as containing high conservation values, provide the best biodiversity benefits in the region and are located where mining interests are limited.

I have stated conditions for the project's draft EA (Appendix 1, Schedule F), which require the proponent to prepare a Biodiversity Offset Delivery Agreement within three years from the granting of the EA. The Biodiversity Offset Delivery Agreement would detail the final offset sites proposed to meet MNES and SSBV requirements, results of ground-truthing and an updated EPBC assessment on the offset sites. This would include updating the EPBC Act Offset Assessment Guide calculations for the offset site based on the final preferred sites chosen and results of ground-truthing, and legally securing the approved offset sites within six months of the Biodiversity Offset Delivery Agreement being approved.

Social and local economic impacts

A social impact assessment (SIA) was completed for the project to assess the potential impacts arising from the project and the proponent's responses in relation to housing and accommodation, workforce management, health and community wellbeing, community and stakeholder engagement and local business and industry content.

The SIA found potential adverse impacts relating to the:

- supply and affordability of housing for purchase and rent
- labour market drain from other sectors into the mining industry
- road safety issues arising from increased usage by heavy vehicles, changing road use protocols and driver fatigue
- heightened anxiety regarding the future direction of the local community and region as a result of mining activity
- interference with Indigenous cultural heritage leading to conflict and a sense of cultural loss
- resident safety and sense of security.

The SIA found that the potential negative impacts arising from the project can be effectively managed and that there were no key impacts identified that indicate the project should be delayed, postponed or re-structured due to potential social or local economic issues. Furthermore, the proponent has committed to a range of actions to enhance, avoid, mitigate and manage these and other impacts. Accordingly, I have imposed a condition for the proponent to report annually on the effectiveness of these actions during construction and for the first two years of operation (Appendix 3).

With workforce numbers expected to peak at around 1800 workers in the third year of construction, and remain constant at 1600–1700 workers for most of the project's duration, the project is expected to provide very tangible long-term local, sub-regional and regional employment opportunities. In addition to the direct economic benefits for individuals and local communities associated with these jobs, the mine's support requirements and the ongoing training and development needs of the workforce represent an important opportunity to diversify the local economy.

The proponent's commitments to maximise local employment over the life of the project, implement local training strategies that also support critical non-mining activity, and provide local businesses with fair and reasonable opportunity to tender for project-related business together should ensure that the project would make a net positive contribution to the local community.

Road impacts

The project would result in an increase in the numbers of light, commercial and over-dimensional vehicles on the state controlled road network and local roads surrounding the project site. The proponent's road impact assessment (RIA) identified intersections and sections of the road network that would require upgrading to facilitate project traffic. I support the view of the Department of Transport and Main Roads (DTMR) that the proponent's RIA should be updated in light of more specific information obtained during detailed design of the project. Accordingly, I have made a number of recommendations within Appendix 4 to address these and related matters.

Cultural heritage

The proponent has developed a Cultural Heritage Management Plan (CHMP) for the project in consultation with the native title claimants, the Wangan and Jagalingou People. Indigenous cultural heritage sites and artefacts were identified throughout the project site

including stone artefacts, scarred trees and most notably, a ceremonial area on Wendouree Station which the proponent has committed to protecting from direct project impacts by developing and implementing a specific management plan.

The most significant non-Indigenous cultural heritage site identified was the subsurface remains of the Burgess Hotel, which is associated with a late nineteenth-century coach route network. The proponent has committed to ensuring adequate identification and management of cultural heritage places and objects. This would be achieved through the implementation of mitigation measures in the project's EMPs and the development and implementation of an Archaeological Management Plan (AMP) for the management of the culturally significant nineteenth-century coach route.

Noise, air quality and greenhouse gases

The proponent identified only a small number of homesteads that would be impacted by noise or dust generated by the Kevin's Corner project due to its remote location.

The proponent has assessed and determined that potential noise and air quality impacts on these sensitive receptors would mostly be within acceptable limits. However, it was predicted that air quality goals would not be met at the Forrester Homestead and noise levels would exceed sleep disturbance criteria on the Surbiton South and Eulimbie properties. The proponent has advised that they are in the process of purchasing the Forrester Homestead and has committed to mitigating the noise and vibration impacts generated by the cumulative impacts of the railway for the Surbiton South and Eulimbie Homesteads, as detailed in the EMP.

The SEIS reports that key greenhouse gas emission sources would include electricity consumption and fugitive emissions of coal seam gas from mining. These emissions would cause the proponent to incur a carbon tax liability attributable to the project pursuant to the provisions of the *Clean Energy Act 2011* (Cwlth). The proponent has committed to minimising the release of Greenhouse Gas (GHG) emissions and the potential impacts of climate change for the life of the project through measures in its EMPs and proponent commitments.

Rehabilitation and final land use

The proponent intends to return the mining lease area to a stable landform capable of supporting the growth of native bushland and low density cattle grazing.

The proponent intends to rehabilitate the disturbed land areas with native flora species where possible and when returning areas to a specific RE, would focus on the selection of native species present prior to disturbance. The EIS identifies a range of usable topsoils for rehabilitation activities within the proposed disturbance areas. The proponent would develop and implement a Topsoil Management Plan (a sub-plan of the mine EMP) to maximise the recovery and re-use of topsoil.

In response to SEWPaC and DEHP comments on the EIS and SEIS, the proponent updated its Rehabilitation Management Plan to include more detailed, measurable and achievable rehabilitation completion criteria. I have stated conditions as part of the draft EA for the project to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with

rehabilitation completion criteria (as specified in the Rehabilitation Management Plan) and rehabilitation must commence progressively as areas become available. Annual reviews of monitoring data must be conducted to assess trends and monitor program effectiveness.

Environmental management plans, proponent commitments and conditions

The proponent will manage impacts of the project by implementing mitigation measures in accordance with my conditions and recommendations, the EMPs and the proponent commitments.

The proponent has prepared two draft EMPs—a mine EMP and an off-lease EMP. The mine EMP applies to project components located within the mining lease area and must be implemented in accordance with the requirements of the EP Act. The off-lease EMP applies to off-lease project components including rail spur construction and operation and mine access road construction activities, to be implemented in accordance with my conditions (Appendix 2).

It is also expected that the proponent's commitments, as detailed in the Proponent Commitment Register, available on the proponent's website and at Appendix 7 of this report, will be fully implemented.

My report includes a substantially complete and outcome-focused draft EA which will require the effective environmental management of activities on the mining lease (Appendix 1). Conditions have also been included to manage the off-lease rail spur and mine access road Appendix 2). I have also made a number of recommendations regarding information requirements for future state government approvals required for the project, including approvals under the *Water Act 2000* and *Transport Infrastructure Act 1994* (Appendix 4).

Coordinator-General's conclusion

I consider that the environmental impact assessment requirements of the SDPWO Act for the Kevin's Corner project have been met and that sufficient information has been provided to enable a thorough evaluation of the potential impacts of the development.

I conclude that there are 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. Conditions proposed in this report have been formulated in order to further manage all impacts associated with the project.

Accordingly, I recommend that the project proceed subject to the conditions and recommendations set out in the appendices of this report. In addition, it is expected that the proponent's commitments will be fully implemented.

This report will be provided to the Commonwealth Minister for the Environment, pursuant to 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 pursuant to section 133 of the EPBC Act.

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

Barry Broe

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Barry Broe
Coordinator-General
30 May 2013

1. Introduction

This report has been prepared pursuant to section 35 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 Kevin's Corner Project (the project).

The report provides an assessment of the key matters associated with the project's potential impacts on the physical, social and economic environment at the local, regional, state and national levels. It does not record all matters identified and subsequently settled during the EIS process. Rather, it concentrates on the substantive environmental effects[3] and related matters identified during the EIS process.

Project information and assessment has been adequate to enable the necessary evaluation of potential environmental impacts, development of mitigation strategies and conditions of approval. The report includes conditions that must be incorporated into subsequent development approvals and licences required to be issued by various State and Local Governments. It also includes recommendations where appropriate to assist and guide relevant decision makers on future assessments and approvals required at the more detailed design phases of the project.

Additional information and investigations will continue to be provided during the detailed design phases of the project and through the further assessments undertaken as part of subsequent Australian, State and Local Government approval process.

This report represents the conclusion of the Coordinator-General's impact assessment process under the SDWPO Act. For information on the EIS process, including details of the organisations and individuals who commented on the proponent's EIS, refer to Section 3 of this report (page 11).

[3] For a definition of 'environmental effects', refer to the Glossary on page 442 of this report.

2. Project description

2.1. The proponent

The proponent[4] for the project is Hancock Galilee Pty Ltd (HGPL). HGPL is a wholly owned subsidiary of GVK Coal Developers (Singapore) Pte Limited (GVKCDPL). Until September 2011, HGPL was owned by Hancock Prospecting Pty Ltd (HPPL).

GVKCDPL is a subsidiary of GVK Natural Resources Pte Limited (GVKNRPL), (a GVK Group company) in joint venture with GVK Power and Infrastructure Limited (GVKPIL).

GVK is an Indian conglomerate with experience and expertise spanning diverse sectors including energy, resources, airports, transportation, hospitality and life sciences. After acquiring the majority ownership in Australian coal and infrastructure projects in Queensland, GVK envisages an investment of US$10 billion in mine, rail and port projects.

2.2. The project

HGPL proposes to develop the Kevin's Corner project, a 30 million tonnes per annum (mtpa) open-cut and underground thermal coal mine in the Galilee Basin. The project includes the development of a 17.8 kilometre (km) rail spur, an airport and associated mining infrastructure.

The project proposes to use the railway infrastructure of the Alpha Coal project to transport coal to the Port of Abbot Point, Bowen. The proponent for the Alpha Coal project is Hancock Coal Pty Ltd.

2.2.1. Location

The project is located approximately 65 km north-west of the Alpha township and 110 km south-west of the township of Clermont within the Barcaldine Regional Council (BRC) area (refer to Figure 2.1) in Central Queensland, Australia. It is located on Mining Lease Application (MLA) 70425 which is directly north of the proposed Alpha Coal project tenement (MLA 70426).

The project site is primarily bounded by grazing land with a small section of the Cudmore Resources Reserve (CRR) to the north-west. The nearest residences of adjacent landholders are located approximately 7 km away from the mine site surface infrastructure.

2.2.2. Components

The Kevin's Corner Project would require developments both on and off the 37 380 hectare (ha) MLA area.

The majority of run-of-mine (ROM) coal would be produced from three individual retreating underground longwall operations (approximately 695 million tonnes) and the remainder from two open-cut pit operations (approximately 184 million tonnes). Overburden would be

[4] For a definition of 'proponent', refer to the Glossary on page 442 of this report.

removed by truck and shovel, excavators and dragline operations and coal would be mined and transported by truck, excavator and conveyors to an on-site coal handling and preparation plant, then conveyed to a train load-out facility for haulage.

The following components would be developed on the mining lease (refer to Figure 2.2):

- **Two open-cut mine areas**—with a combined area of 21 km^2, extending over an initial strike length of 6.5 km reducing to a steady strike length of 4 km.
- **Three underground mine areas**—longwall panels would be approximately 400 metres (m) wide, between 3.5 km to 6 km long and an average extraction height of 4.5 m for the Central and Southern mines and 3.5 m for the northern mine. The width of coal left between longwall panels would be between 33.5 m and 46 m. Subsidence of up to a maximum of 2.9 m deep is expected at the surface.
- **Coal handling and preparation facilities**—including sizing facilities for open-cut and underground operations, an overland conveyor system, automated stacking and reclaim facilities, a multi-module coal handling and preparation plant (CHPP), rail loop and spur.
- **Mine infrastructure area**—site operations control facilities, site vehicle parking, heavy vehicle tyre change facilities, vehicle wash facilities, servicing and maintenance workshops, small stores and first aid facilities.
- **Mine waste and water facilities**—tailings storage facility, overburden emplacements and off-stream water dams.
- **Light industrial area**—workshop, warehouse, storage and welding facilities located along the mine access road adjacent to rail, power and water supplies and the airport. Other mine and support services located in this area would include security, administration, waste management and environmental management facilities.
- **Accommodation village**—suitable for accommodating a workforce of approximately 2000 employees, situated approximately 10 km from the mine.
- **Airport**—a 2.5 km runway to cater for aircraft up to and including an Airbus A320 or Boeing 737 located 8 km east of the project mine infrastructure area.

The following components would be located off the mining lease (refer to Figure 2.3):

- **rail spur**—2 km (17.8 km including both on- and off-lease components) of rail infrastructure connecting to the proposed Alpha Coal project railway
- **mine access road**—8 km realignment of the Jericho-Degulla Road
- **stock route**—to be realigned where possible with the Jericho-Degulla Road alignment.

The total area of disturbance as a result of the project would be as shown in Table 2.1 and Figure 2.4 below.

Table 2.1 Disturbance areas

Activity	Maximum disturbance area (ha)
Infrastructure, roads and tracks	2566
Pits, voids and overburden emplacements	3315
Tailings storage facility	420
Dams and surface water features	360
Modelled subsidence impact on high value MNES habitat	476
Modelled subsidence impact on other[5] high value state-significant biodiversity value (SSBV) habitat	156
Other lands (includes exploration, groundwater monitoring bores and underground mining)	30 087
Total	37 380

[5] Total modelled subsidence impact to high value SSBV is 632ha, which includes 476ha of high value MNES habitat

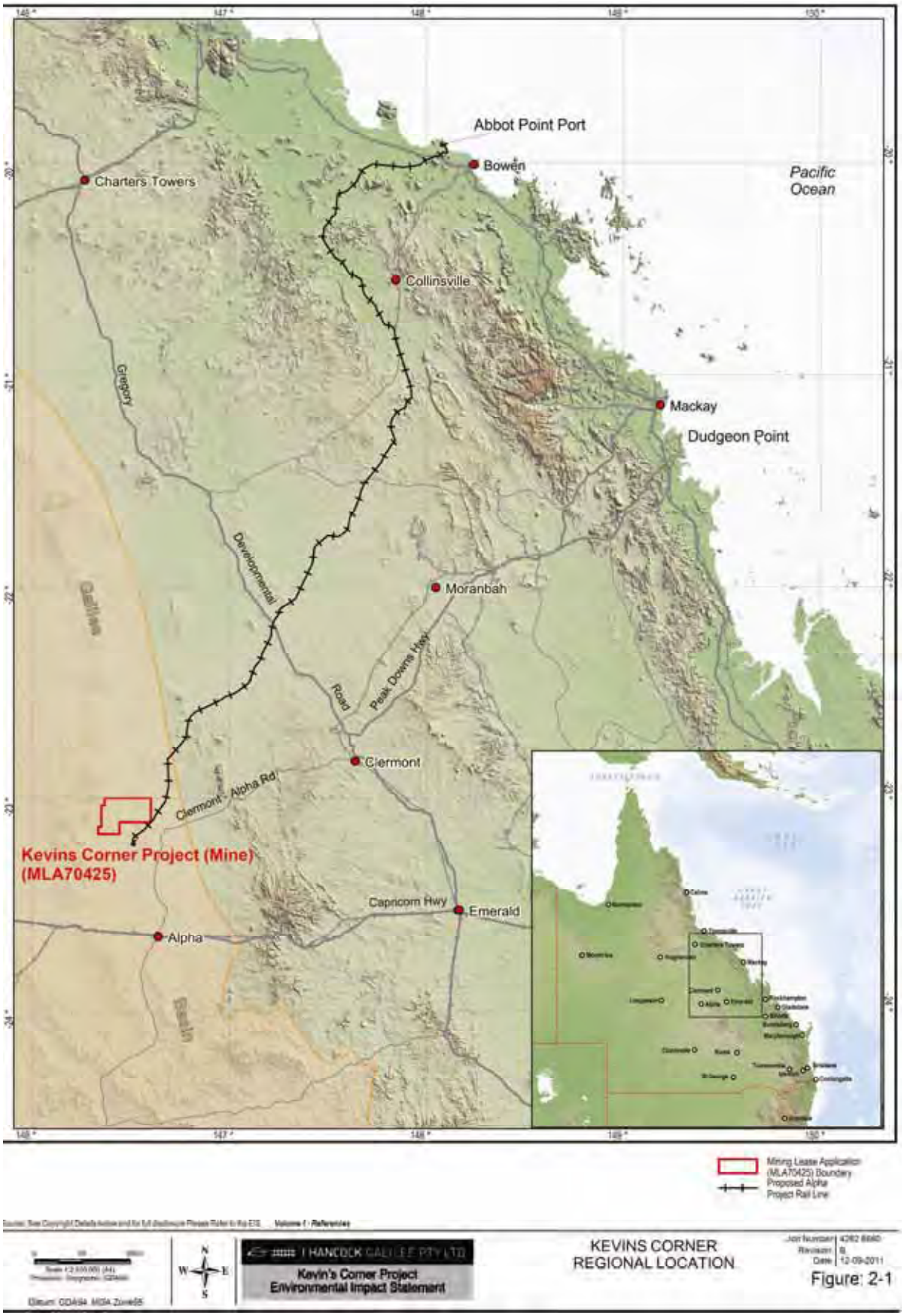


Figure 2.1 Regional location

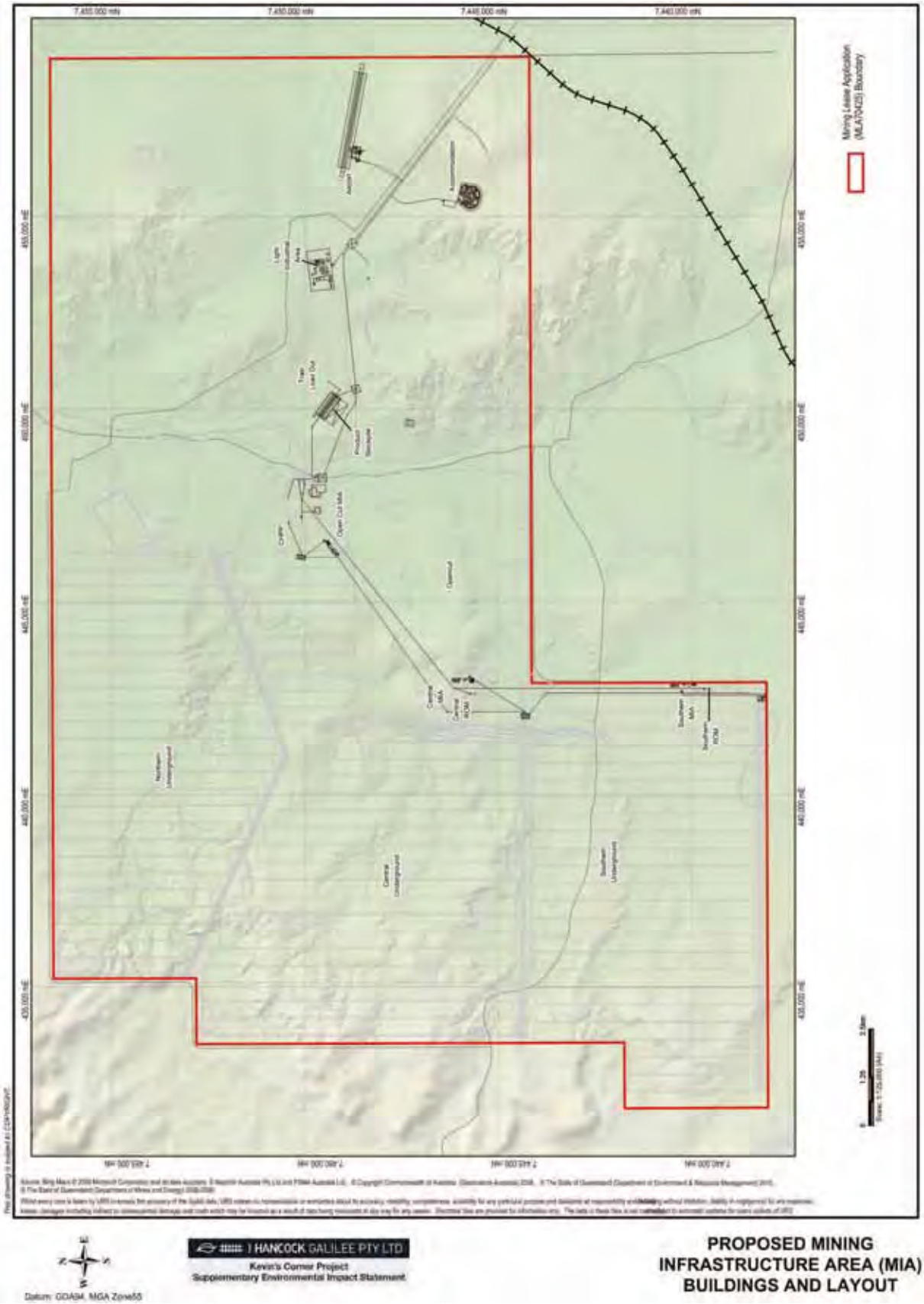


Figure 2.2 Mining lease project components

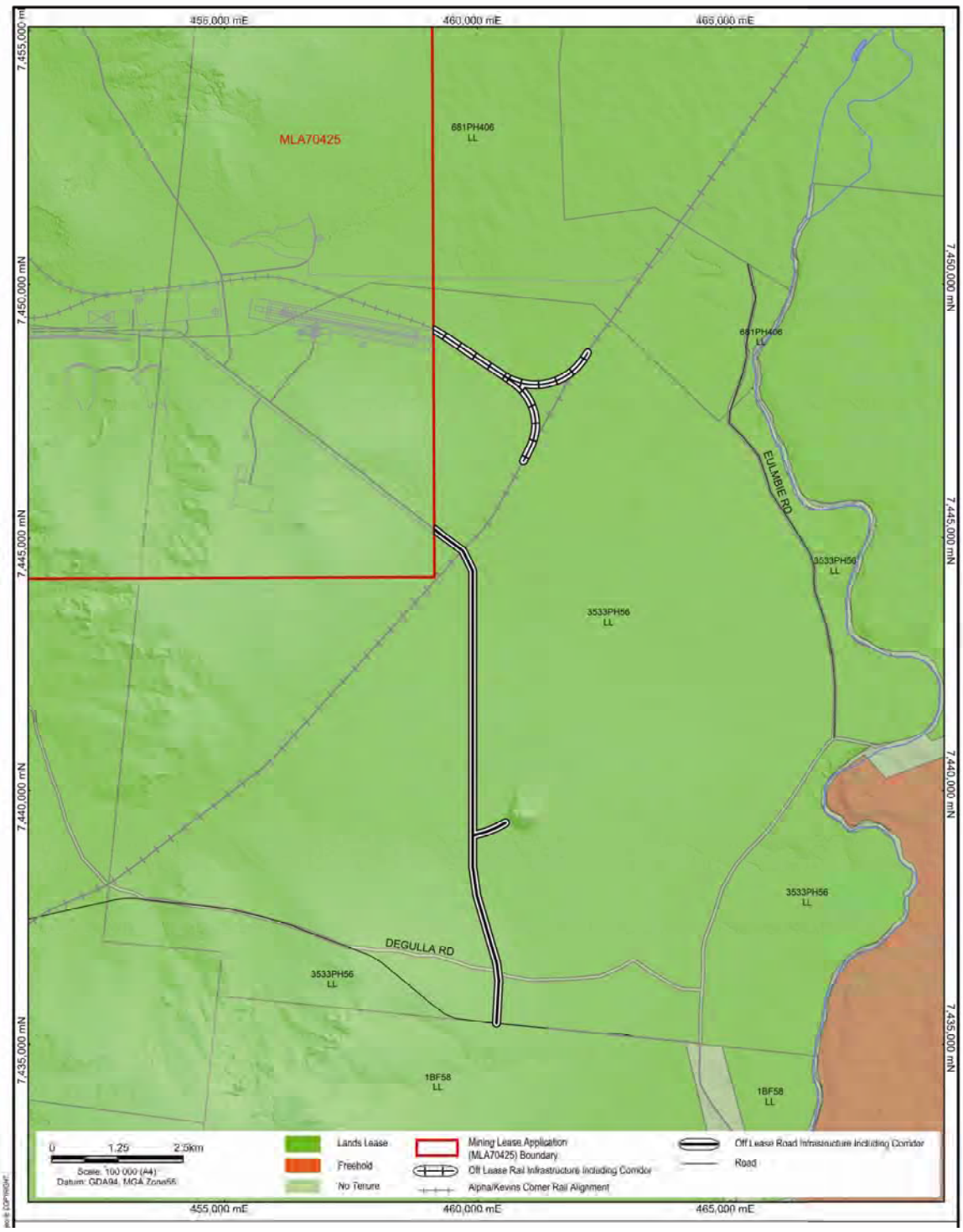


Figure 2.3 Off lease project components

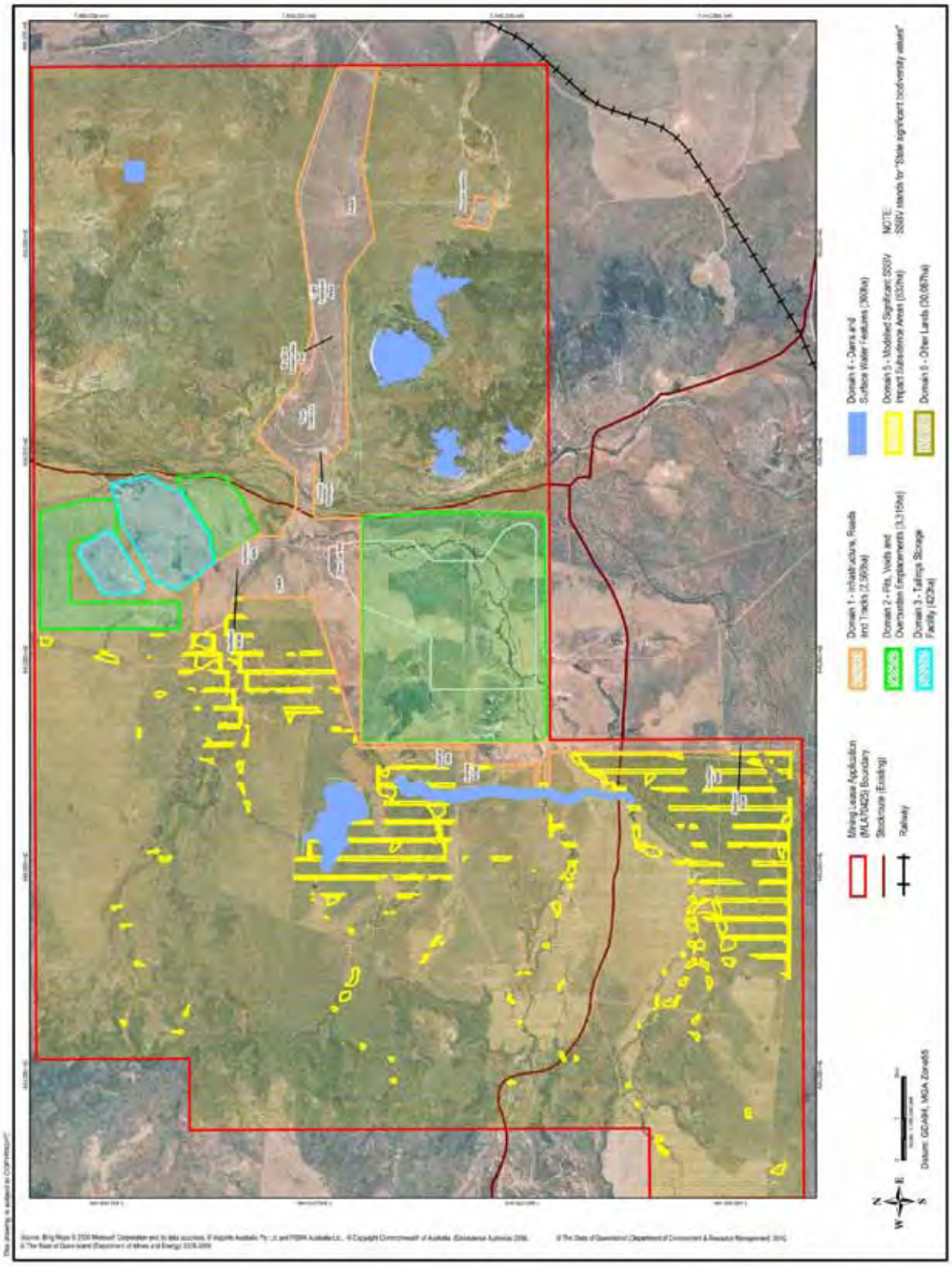


Figure 2.4 Overall mining lease site layout domain plan

2.2.3. Development stages

The construction phase for the mine and associated infrastructure is expected to total 48 months, with the bulk of the construction being undertaken in the first 27 months prior to the mining of the first coal.

Infrastructure construction, maintenance, rehabilitation and decommissioning activities would be undertaken throughout the operating life of the mine.

The MLA comprises a 40-year lease which includes 30 years of production plus some exploration, pre construction, construction and decommissioning phases. It is possible that there will be sufficient resources to extend the project life beyond 30 years of production. Any extension of mining activities will be subject to further assessment and approval in the future.

2.2.4. Dependencies and relationships with other projects

The project depends on the completion of the following projects, which are currently at various stages of receiving environmental and other approvals including the:

- Alpha Coal project—an open-cut coal mine adjoining the southern boundary of the Kevin's Corner mine footprint and a rail line with a 60 mtpa capacity, which is proposed to be used by the Kevin's Corner Project to transport product coal to Abbot Point. I determined that the Alpha Coal project could proceed subject to conditions on 24 May 2012. The project received the Commonwealth Environment Minister's approval of the controlled action, subject to conditions, on 23 August 2012.
- Galilee Basin Transmission Project—a high voltage power transmission line proposed by Powerlink, which would provide power to the mine site and other Galilee Basin projects via a new 275-kilovolt transmission line from the existing Lilyvale Substation (near Emerald) to a new substation near Alpha.
- Abbot Point Coal Terminal X110 Expansion Project (also know as Terminal 3 (T3))—a new onshore coal terminal where coal from the Kevin's Corner and Alpha Coal projects would be transported prior to being transferred to offshore shipping berths—a project for which Hancock Coal Infrastructure Pty Ltd is the preferred developer. The project received the Federal Environment Minister's approval of the controlled action, subject to conditions, on 10 October 2012.

The impacts of the rail corridor, for transporting coal from both the Kevin's Corner and Alpha Coal mines, were considered as part of the Alpha Coal project.

The Kevin's Corner project is also dependent on the ability of the proponent to acquire access to 120 gigalitres of externally sourced water over the 30-year life of the mine (the subject of separate approvals) from the following two sources:

- purchase of water allocation from the Emerald Fairbairn Dam in association with a dedicated water pipeline
- flood harvesting from the Belyando River.

Projects in the vicinity of the Kevin's Corner project include:

- Alpha Coal Project

- Galilee Coal Project—Northern Export Facility (also known as China First), a new 30 mtpa, open-cut and underground coal mine adjacent to the Alpha Coal project site (to the south) proposed by Waratah Coal Pty Ltd to supply thermal coal to overseas customers
- South Galilee Coal Project, a new 17 mtpa open-cut and underground coal mine situated south of the town of Alpha proposed by a joint venture between AMCI (Alpha) Pty Ltd (a subsidiary of the AMCI Group) and Alpha Coal Pty Ltd (a subsidiary of Bandanna Energy Limited) to supply thermal coal to overseas customers.

2.3. Project rationale

Coal resources in the Galilee Basin are currently undeveloped. The project aims to develop the site in order to provide high volumes of coal to the world thermal coal market, especially to the growth markets in Asia. Key objectives of the project are to:

- obtain optimal production and sales from the available resources
- design, construct and operate a mine and associated infrastructure that complies with health, safety, environment and community standards and indicators, relevant legislation and industry best practice
- use existing, proven strategies and industry best practice to minimise impacts on the environment and the communities associated with the project.

The project meets Queensland Government objectives in realising the timely development of the Galilee Basin while ensuring the community benefits and environmental objectives are supported, therefore contributing to a four-pillar economy. Overarching project-wide benefits include:

- A$4.2 billion investment
- employment for construction, operation, and other indirect employment benefits, including the creation of approximately 1800 construction jobs and 1600 operational jobs
- significant export income
- local and state economic benefits
- improved infrastructure into the region, including upgrades to roads and airport, and facilitating additional power and water supplies to the region
- significant state and government taxes and royalties
- access to the proponent’s on-site community services and social infrastructure to complement existing facilities in the area
- direct and indirect local, regional and Indigenous employment opportunities beyond traditional agricultural sector roles
- retention of younger residents through enhanced employment opportunities
- increased revenue and viability for local businesses arising from project-related expenditure.

Refer to section 6 of this report for an evaluation of social and economic impacts resulting from the project.

3. Impact assessment process

3.1. Overview

This section details the steps involved in the project's EIS assessment process. For an explanation of the EIS process, refer to **www.dsdip.qld.gov.au**

In undertaking this evaluation, I have considered the following:

- initial advice statement[6] (IAS)
- EIS
- issues raised in submissions relating to the EIS
- supplementary information in the form of a supplementary EIS (SEIS)
- issues raised in submissions relating to the SEIS
- revised reports and plans in response to SEIS submissions
- advice received from the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Developments (IESC)
- advice received from the Commonwealth Department for Sustainability, Environment, Water, Population and Communities (SEWPaC)
- local and state government advisory agency advice
- comments and properly made submissions[6] from non-government organisations and members of the public.

Table 3.1 shows the steps taken in the project's EIS process.

Table 3.1 Overview of EIS process

Date	Process
7 September 2009	Final initial advice statement and request for project declaration received
11 September 2009	Project declared 'Significant Project'[6] by Coordinator-General
08 September 2009	Australian Government determined project is a 'controlled action'
31 October 2009	Submission period on draft terms of reference (TOR) commenced
30 November 2009	Submission period on draft TOR closed (4-week period)
9 February 2010	TOR finalised
31 October 2011	EIS released for public and agency comment (6-week period)
12 December 2011	Submission period on EIS closed
5 November 2012	Supplementary project information available for public and agency comment (4-week period)
3 December 2012	Submission period on supplementary project information closed

[6] For a definition, refer to the Glossary on page 442 of this report.

3.2. Coordinated project declaration

On 11 September 2009 the then Coordinator-General declared this project to be a 'significant project'[7] under section 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act). This declaration initiated the statutory environmental impact evaluation procedure of Part 4 of the Act, which required the proponent to prepare an EIS for the project.

The SDPWO Act was amended in December 2012 (with the amendments taking effect on 21 December 2012). The amendments have renamed 'significant project' to 'coordinated project'. The project will be referred to as a coordinated project throughout this evaluation report.

3.3. Controlled action

On 8 September 2009, the Commonwealth Environment Minister determined that the project is a 'controlled action'[7] under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) (EPBC reference 2009/5033).

The relevant controlling provisions[7] under the EPBC Act are:

- sections 18 and 18A listed threatened species and ecological communities
- sections 20 and 20A migratory species protected under international agreements.

A bilateral agreement[8] exists between the Australian and Queensland governments which allows the Queensland Government to conduct the EIS assessment process to meet the needs of both jurisdictions. Section 8 of this report (MNES) lists each controlling provision under the EPBC Act and explains the extent to which the Queensland Government EIS process addresses the actual or likely impacts of the project on the matters covered by each provision.

The Commonwealth Environment Minister will use the information in section 8 to make a decision on the project under the EPBC Act.

3.4. Terms of reference

The draft TOR were released for public and advisory agency comment from 31 October 2009 to 30 November 2009. Fourteen submissions were received on the draft TOR; thirteen from advisory agencies and one from a non-government organisation.

The draft TOR were revised following consideration of submissions the received, and were finalised on 9 February 2010 by the Coordinator-General. The then Commonwealth Department of the Environment, Water, Heritage and the Arts reviewed and approved the final TOR for release.

[7] For a definition refer to the Glossary on page 442 of this report.

3.5. Review of the EIS

The EIS prepared by the proponent was released for public and advisory agency comment from 31 October 2011 to 12 December 2011.

Twenty-two submissions were received on the EIS. Table 3.2 summarises the issues raised in public and agency submissions on the EIS.

Advice was provided from SEWPaC on 26 January 2012 with respect to the EIS assessment of potential impacts on MNES.

For an assessment of the environmental impacts of this project, refer to Section 5 of this report. For an assessment of the impacts of this project to MNES, refer to Section 8.

Table 3.2 Summary of public and agency submissions on the EIS

Agency	No. submissions	Issue
Queensland Government • Department of Communities • Queensland Treasury • Department of Transport and Main Roads • Department of Community Safety • Queensland Police Service • Department of Employment, Economic Development and Innovation • Queensland Health • Department of Environment and Resource Management • Department of Local Government and Planning	**9**	• air quality impacts • biodiversity impacts and offsets • cumulative impacts • disposal of mine waste • economic impacts • greenhouse gas impacts • groundwater impacts • land use impacts • site rehabilitation • social impacts • stakeholder consultation • surface water impacts • transport impacts • water supply
Local Government • Barcaldine Regional Council	**1**	• air quality impacts • biodiversity impacts and offsets • cumulative impacts • disposal of mine waste • economic impacts • greenhouse gas impacts • groundwater impacts • land use impacts • site rehabilitation • social impacts • stakeholder consultation • surface water impacts • transport impacts • water supply

Agency	No. submissions	Issue
Non-government organisations • Asia Pacific Strategy • Road Accident Action Group • Doctors for the Environment Australia Inc. • Barcaldine Kindergarten Association Inc. • Capricorn Conservation Council Inc. • Nebo Community Development Group Inc.	**6**	• air quality impacts • cumulative impacts • economic impacts • greenhouse gas impacts • social impacts • stakeholder consultation • transport impacts
Private individuals	**6**	• air quality impacts • biodiversity impacts and offsets • cumulative impacts • economic impacts • greenhouse gas impacts • groundwater impacts • land use impacts • social impacts • stakeholder consultation • surface water impacts • transport impacts
TOTAL	**22**	

3.6. Supplementary information

On 28 May 2012, I requested that HGPL submit supplementary information to address matters raised in submissions on the EIS. Specific issues requiring supplementary information included:

- environmental assessment of off-mining-lease infrastructure (proposed rail spur and access road)
- subsidence impacts and management
- geochemical assessment of coal mining waste
- aquatic ecology assessment
- revised air quality and greenhouse gas assessment
- revised noise and vibration assessment
- revised road impact assessment
- revised surface water hydraulics assessment
- revised groundwater modelling and assessment
- site water management (basis of design)
- cumulative surface water assessment
- revised MNES assessment
- Biodiversity Offsets Strategy
- Social Impact Management Plan (SIMP)
- Rehabilitation Management Plan (RMP)
- Water Supply Strategy
- updated environmental management plans for the mine and rail spur.

Given the amount of new or updated information outlined in the SEIS, I determined that the SEIS needed to be released for public comment; and SEWPaC concurred. Subsequently, the supplementary project information was made available for public and agency comment on 5 November 2012 for a four week period.

Twenty submissions were received from state and local government agencies, and from private organisations and individuals. The categories of issues raised included:

- air quality
- biodiversity impacts and offsets
- stakeholder consultation
- CRR management
- cultural heritage
- cumulative impacts
- economic impacts
- emergency management
- erosion and sedimentation
- flora and fauna

- geological and geomorphological impacts
- land management
- noise impacts
- social impacts
- stock route impacts
- subsidence
- telecommunications
- traffic and transport
- waste
- water.

SEWPaC provided advice on the SEIS on 3 December 2012. Key matters raised included:

- potential habitat loss
- environmental offsets proposed for residual impacts
- outstanding flora surveys
- rehabilitation of project site post mining
- predicted subsidence impacts, potentially resulting in direct and indirect impacts on MNES.

For an assessment of the impacts of this project on MNES, refer to Section 8 of this report.

3.7. Referral to the Independent Expert Scientific Committee

Queensland is a signatory to the Council of Australian Governments (COAG) National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development (NPA). The NPA requires coal seam gas or large coal mining development proposals undergoing environmental impact assessment, and that are likely to have a significant impact on water resources, to be referred to the IESC.

On 20 December 2012, the Coordinator-General submitted to the IESC a joint request for advice (with SEWPaC) for the Kevin's Corner project. The IESC provided final Kevin's Corner project advice to the Coordinator-General and SEWPaC on 7 February 2013.

The IESC advice has informed my evaluation of the Kevin's Corner project and is discussed in the relevant sections of this report. Appendix 5 of this report provides a consolidated response to the IESC advice.

4. Project approvals

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

Approvals sought by the proponent directly from this Coordinator-General's evaluation report are listed in Table 4.1. Other approvals which are the subject of future separate applications are listed in Table 4.2.

More information about Australian government, State government and local government approvals is provided in the subsections below.

Table 4.1 Conditions for approvals sought directly from this Coordinator-General's report for the project

Project component/ activity	Relevant approval	Legislation	Authority	Status
Whole of project	Controlled action	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)	SEWPaC	Commonwealth Minister's decision due within 30 business days of receiving Coordinator-General's report
Mining and associated activities on the mining lease	Mine lease for MLA70425	*Mineral Resources Act 1989*	DNRM	Certificate of Application issued 13 March 2012
Mining and associated activities on the mining lease	Environmental Authority (EA) for mining lease	*Environmental Protection Act 1994*	DEHP	Draft EA conditions provided in Appendix 1 of this report.

Table 4.2 Subsequent approvals likely to be required for the project

Item	Relevant approval	Legislation	Status
Airport	Aerodrome certification	*Civil Aviation Safety Regulations 1998*	On-tenure, detail to be confirmed
Open new roads and stock routes	Reconfiguration of a Lot (RoL)	*Sustainable Planning Act 2009*	On-tenure and off-lease, detail to be confirmed
Close on-tenure roads and stock routes	Close roads and stock routes where on-tenure	*Land Act 1994* and *Land Protection (Pest and Stock Route Management) Act 2002*	On-tenure, detail to be confirmed
Roadworks—state controlled roads	Approval to undertake works[9] and ancillary works to a state-controlled road	*Transport Infrastructure Act 1994*	Off-tenure, detail to be confirmed
Roadworks—local roads	Approval to make an alteration or improvement to a local government road	*Local Government Act 2009*	Off-tenure, detail to be confirmed
On site sewage treatment plant	Approval for an onsite sewage treatment plant	*Plumbing and Drainage Act 2002*	On-tenure, detail to be confirmed
On site water treatment plant	Approval for an onsite water treatment plant	*Plumbing and Drainage Act 2002*	On-tenure, detail to be confirmed
Referable and hazardous dams	Licences for referable and hazardous dams	*Water Act 2000*	On-tenure, detail to be confirmed
Taking or interfering with water	Licences for taking or interfering with water for dams, creek diversions and creek crossings, mine dewatering and monitoring bores	*Water Act 2000*	On- and off-tenure, detail to be confirmed
Bore installation, taking water for groundwater monitoring, dewatering and compensatory water supply	Licences for taking and interfering with groundwater	*Water Act 2000*	On- and off-tenure as required, detail to be confirmed
Riverine protection permit for creek diversions and crossings	Riverine protection permit	*Water Act 2000*	On- and off-tenure as required, detail to be confirmed
Clearing protected plants	Species Management Program (SPM) and/or Damage Mitigation Permit	*Nature Conservation Act 1992*	On- and off-tenure as required, detail to be confirmed
Clearing least-concern plants	Protected plant permit	*Nature Conservation Act 1992*	Off-tenure as required, detail to be confirmed

[9] For a definition of 'works', refer to the Glossary on page 442 of this report.

Item	Relevant approval	Legislation	Status
Protected animals	Interfering with an animal breeding place	*Nature Conservation (Wildlife management) Regulation 2006*	On- and off-tenure, detail to be confirmed
Mapping of assessable remnant vegetation	Property Map of Assessable Vegetation (PMAV)	*Vegetation Management Act 1999*	Off-tenure, detail to be confirmed
Clearing of native vegetation and high value regrowth	Clearing of native vegetation and high value regrowth	*Vegetation Management Act 1999*	Off-tenure, detail to be confirmed
Clearing of regional ecosystems	Clearing of regional ecosystems	*Vegetation Management Act 1999*	Off-tenure, detail to be confirmed
Clearing of essential habitat communities	Clearing of essential habitat communities	*Vegetation Management Act 1999*	Off-tenure, detail to be confirmed
Operational works—bridge works across creeks	Permit to construct or raise barrier works	*Fisheries Act 1994*	Off-tenure, detail to be confirmed
Cudmore Resource Reserve	Undermine a protected area.	*Nature Conservation Act 1992*	On-tenure, agreement to be reached with DNPRSR
Forest products and quarry materials	Interfering or use of forest products and quarry materials on State lands and certain freehold lands owned by the State	*Forestry Act 1959*	On- and off-tenure, detail to be confirmed
Indigenous cultural heritage	Cultural Heritage Management Plan	*Aboriginal Cultural Heritage Act 2003*	On and off-tenure

4.1. Australian Government approvals

4.1.1. Controlled action

The project was declared by the Commonwealth Environment Minister to be a 'controlled action' pursuant to section 75 of the EPBC Act on 8 September 2009, and the EIS process has been undertaken in accordance with the requirements of the bilateral agreement between the Queensland and Australian governments relating to environmental assessment.

Accordingly, subsequent to this report, the controlled action will be considered by the Commonwealth Environment Minister for approval under section 133 of the EPBC Act once the Minister has received this evaluation report prepared under section 35 of the SDPWO Act.

The Minister will use the information in the report to make a decision under the EPBC Act as to whether the project should proceed, and if so, apply conditions to the approval necessary to limit the impact on MNES.

4.1.2. Aerodrome certification

The proponent is proposing to construct a 2.5 km runway located 8 km east of the project mine infrastructure area to cater for aircraft up to and including an Airbus A320 or Boeing 737.

The proponent must seek aerodrome certification from the Civil Aviation Safety Authority (CASA) pursuant to Part 139 of the Civil Aviation Safety Regulations 1998 (Cwlth).

4.2. State government approvals

The applicable state-based planning and approvals framework is primarily established by the:

- *Mineral Resources Act 1989* (MRA), which regulates the mining tenures
- *Environmental Protection Act 1994* (EP Act), which regulates Environmental Authorities (EAs) and environmentally relevant activities[10] (ERAs) for mining and petroleum activities
- *Sustainable Planning Act 2009* (SPA), which regulates development off the mining lease areas.

4.2.1. Mining lease application

Mining and associated mining activities undertaken as part of the project will be carried out within mining lease application (MLA) 70425.

Before mining commences, a mining lease must be granted pursuant to the MRA. This process is subsequent to the issue of the EA for mining activities pursuant to the EP Act.

4.2.2. Environmental authority

Under the EP Act, an Environmental Authority (EA) is required to carry out 'mining activities' as defined under section 147 of that Act. The project would involve the following types of mining activities:

- mining under the MRA
- processing mined materials
- activities directly associated with, or facilitating or supporting, the mining and processing activities
- rehabilitation and/or remediation
- actions taken to prevent environmental harm.

The Department of Environment and Heritage Protection (DEHP) has provided draft EA conditions for the mining activities on the proposed mining lease, which are included in Appendix 1 of this report and are referred to, where relevant, in the subsections of section 5 of this report.

[10] For a definition of an 'environmentally relevant activity', refer to the Glossary on page 442 of this report.

4.2.3. Environmentally relevant activities

Under the EP Act, a development permit issued by DEHP is required to carry out an ERA. The provisions of the EA (mining activities) as described in section 4.2.2 above also provide authority for any ERAs that occur on the mining lease.

The proponent is required to submit applications for ERAs that fall outside of the EA and mining lease areas. No ERAs have been proposed off the mining lease for the project.

4.2.4. Other state approvals

Other approvals may be required for project activities on and off the mining lease that are not related to the EA (mining lease) or development approval by local governments. For the project, these may include:

- watercourse diversions—*Water Act 2000* (Water Act)
- harvesting of water or interception of overland flow—Water Act
- taking or interfering with artesian or sub-artesian water (i.e. construction of groundwater bores)—Water Act
- relocation of a road or stock route—*Land Act 1994*
- interfering with animal breeding places—Nature *Conservation Act 1992* (NC Act)
- undermining a protected area—NC Act
- clearing of protected plants—NC Act
- roadworks to state controlled roads—*Transport Infrastructure Act 1994*
- clearing vegetation (regional ecosystems, essential habitat communities, assessable vegetation, high value regrowth vegetation) —*Vegetation Management Act 1999* (VM Act)
- permit to construct or raise barrier works—*Fisheries Act 1993*

Under section 87 of the Aboriginal Cultural Heritage Act 2003 (ACH Act), a Cultural Heritage Management Plan (CHMP) must also be developed and approved where an EIS is required for a project. The proponent has developed a CHMP for the entire project area, in consultation with the native title claimants. Refer to section 5.10 of this report for more information.

4.3. Local government approvals

The Kevin's Corner project site is wholly located within the BRC area. The BRC was formed on 15 March 2008 following the amalgamation of the shires of Amarac, Barcaldine and Jericho. The mine site is located within the former Jericho Shire Council area. Under the transitional arrangements for the amalgamated councils, the planning schemes for the former shires remain applicable in assessing development until a new regional council planning scheme comes into effect. The Jericho Shire Planning Scheme remains the planning scheme against which any applicable assessable development would be assessed off the mining lease.

The development of a mining activity for which an EA applies is exempt from assessment against a local government planning scheme under SPA. However, development required off

the mining lease, specifically construction of the mine access road (8 km), would require development approval under the Jericho Shire Planning Scheme.

Construction and operation of the rail spur (2km) may also require development approval, depending on the State government's future decision regarding the most appropriate statutory instrument to regulate private railways from the Galilee Basin to the Port of Abbot Point (refer to section 4.3.1 of this chapter for more information).

The proponent has completed the necessary environmental assessment of the off-lease components (refer to SEIS Appendix I: Off Lease Assessment and SEIS Appendix T2: Off Lease Environmental Management Plan). This has allowed for the development of conditions for the construction of the off-lease project components, which must apply to any future approval of these project components (refer to Appendix 2 of this report).

4.3.1. Rail spur approval

The State government policy position for the coordinated development of rail corridors from the Galilee Basin to the Port of Abbot Point, supports a north-south corridor spanning the alignment of the railway line proposed as part of the Alpha Coal project (refer to section 2.2.4 of this report for more information).

At this stage of the project evaluation a decision does not need to be made regarding the preferred statutory instrument for regulating the construction and operation of the rail spur. The following are the most applicable statutory instrument options which could be applied:

- the Jericho Shire Planning Scheme and SPA – a development approval for a material change of use
- Community Infrastructure Designation (CID) – under the SPA Regulation 2009, railway facilities are included as types of community infrastructure. Under a CID those development aspects of the project included in the designation would not require approval under any local government planning scheme. However, any state regulatory requirements would still apply. CIDs can be made by a local government or any relevant Minister.
- State Development Area (SDA) – the relevant land is declared under the SDPWO Act to be a SDA and any development is then regulated under a development scheme. The Local Government planning scheme would not apply.

5. Evaluation of environmental impacts

5.1. Groundwater

5.1.1. Introduction

Section 12 and Appendix N of the EIS and Appendix L of the SEIS present the project's hydrogeological context and an assessment of potential impacts of the project on groundwater resources. The EIS outlined how mining would occur below the regional water table and that it would be necessary to conduct dewatering (i.e. remove groundwater) in order for mining to occur safely.

Submissions on the EIS and SEIS raised a number of issues in relation to potential groundwater impacts, including:

- inadequate predictive groundwater modelling
- mine dewatering impacts on the Great Artesian Basin (GAB)
- mine dewatering impacts on groundwater security
- mine dewatering impacts on registered springs, vegetation communities and stygofauna
- impacts on groundwater quality from tailings discharge and subsidence
- cumulative groundwater impacts.

I have considered each of the submissions and how the SEIS and subsequent information received from the proponent has responded to submitter issues as part of my evaluation of the environmental impacts of the project.

As noted in section 3.7 of this report, advice received from the IESC has informed my evaluation of the Kevin's Corner project and I consider the following items of that advice to be relevant to my evaluation of potential groundwater impacts:

- Localised faulting and GAB connectivity (item 4) and determining an appropriate drawdown trigger levels for the Rewan Formation (item 11(c)). Section 5.1.3 provides a response to this item.
- Groundwater quality impacts from tailings discharge and subsidence (item 5). Section 5.1.6 provides a response to this item.
- Developing a site and regional water balance model, and the risk-based assessment of cumulative impacts (item 3). Section 5.1.7 provides a response to this item.

A consolidated response to the IESC advice is provided in Appendix 5 of this report.

5.1.2. Assessment methodology

The EIS presents a regional numerical groundwater model, based on available site-specific hydrogeological data, to enable the identification and assessment of the potential impacts of mine dewatering on regional confined groundwater resources.

In response to submissions received on the EIS and to enable the more robust assessment of potential groundwater impacts, the proponent conducted further hydrogeological studies and more comprehensive predictive groundwater modelling for the SEIS.

Post-EIS hydrogeological studies included additional drilling, aquifer testing, field measurements, groundwater sampling, and the compilation and validation of aquifer hydraulic parameter data. Groundwater monitoring bores have been constructed at a number of sites throughout the Kevin's Corner and adjacent Alpha project MLAs (refer to Figure 4-17, SEIS, Appendix L: Groundwater Report). Hydrogeological data collected over a two-year period was used to establish the baseline groundwater conditions. Interrogation of this data allowed for the construction and calibration of two 'built-for-purpose' models:

- **Life of Mine**: a refined predictive groundwater model, calibrated using both steady state and transient data, to provide an accurate estimate of groundwater ingress over the 30-year life of mine (LOM) for the Kevin's Corner and Alpha Coal projects
- **Post-mining**: integrated surface water–groundwater model, to provide a more detailed and accurate simulation and assessment of final void water levels and potential long-term groundwater flow levels.

The Department of Natural Resources and Mines (DNRM) advises that the updated groundwater models (as presented in the Groundwater Report, SEIS, Appendix L) provides for the comprehensive predictive analysis of groundwater impacts arising from both Kevin's Corner and the adjacent Alpha Coal mine over the life of these projects.

In order to validate the modelling predictions, groundwater conceptualisation and current assessment of cumulative groundwater impacts, the proponent has made a commitment (Commitment 12.10, Appendix 7 of this report) to undertake modelling audits through the life of the Kevin's Corner project and post-mining. Modelling audits of the proponent's groundwater models would be undertaken on a regular basis (no longer than every 3 years). Modelling results would be provided to the relevant administering authority for review.

Coordinator-General's conclusion

Based on the additional hydrogeological studies and comprehensive predictive groundwater modelling completed for the SEIS, advice from DNRM and the proponent commitment to undertake regular groundwater model validation, I am satisfied that the proponent's groundwater assessment methodology adequately allows for the identification and assessment of potential groundwater impacts.

5.1.3. Mine dewatering impacts on the GAB

Figure 5.1, a schematic section of the Galilee Basin and GAB based on geological modelling developed for the SEIS (refer to section 4.4.4, SEIS, Appendix L), shows that the project mine footprint does not extend far enough west to intercept the closest GAB aquifer (the Clematis Sandstone). Therefore, potential impacts on the GAB may only arise from groundwater draining via geological fault structures from the Clematis Sandstone through the Rewan Formation into the aquifers of the Bandanna Formation and Colinlea Sandstone. This would require a reduction in head in the Colinlea Sandstone significant enough to induce the transfer of water from the Clematis Sandstone through the approximately 175-metre thick Rewan Formation.

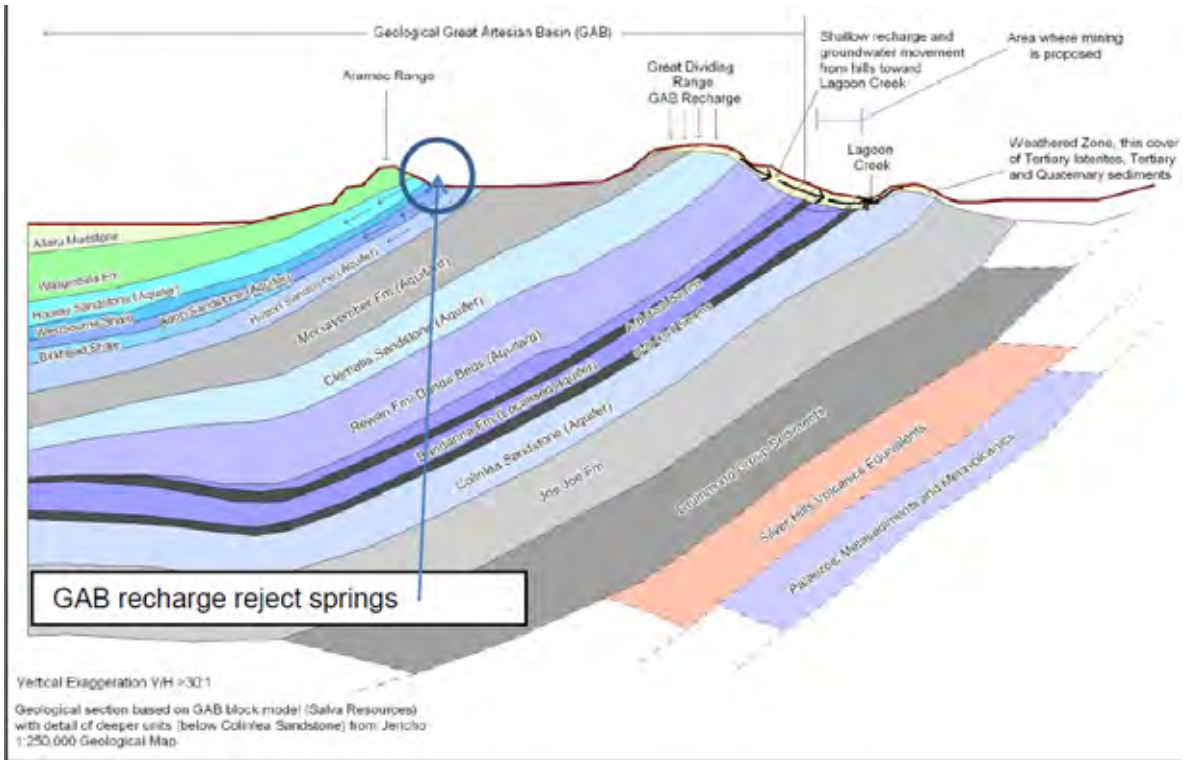


Figure 5.1 Schematic section of the Galilee Basin and GAB

Note: The registered recharge reject springs occur at the Hutton sandstone outcrop, separated from the proposed mining from significant aquitards (Bandanna Formation, Rewan Formation and Moolayember Formation).

It is generally accepted that the Rewan Formation is a regional aquitard that prevents significant inter-aquifer transmission of water within and between basins.[11]

No major regional scale fold and fault structures have been mapped crossing or connecting any of the geological units within and adjacent to the mining lease area (1:250000 Jericho Geological Map, Geological Survey of Queensland (GSQ)[12]). Furthermore, exploration drilling logs and seismic geophysical surveys of the mining lease area did not indicate significant faulting or displacement of coal seams that could promote inter-aquifer or inter-basin hydraulic connection. Some minor faults were detected across the mining lease area (refer to Figure 5.2). The minor faults are located east of the most easterly outcrop of the Rewan Formation and are consequently not connected to the Rewan. In this area, Tertiary sediments are underlain by either the Bandanna Formation or the Colinlea Sandstone and not by the Rewan.

[11] Habermehl MA and Lau JE, *Hydrogeology of the Great Artesian Basin Australia* (Map at scale 1:2,500,000), Australian Geological Survey Organisation, Canberra, 1997.
[12] http://mines.industry.qld.gov.au/geoscience/about-gsq.htm

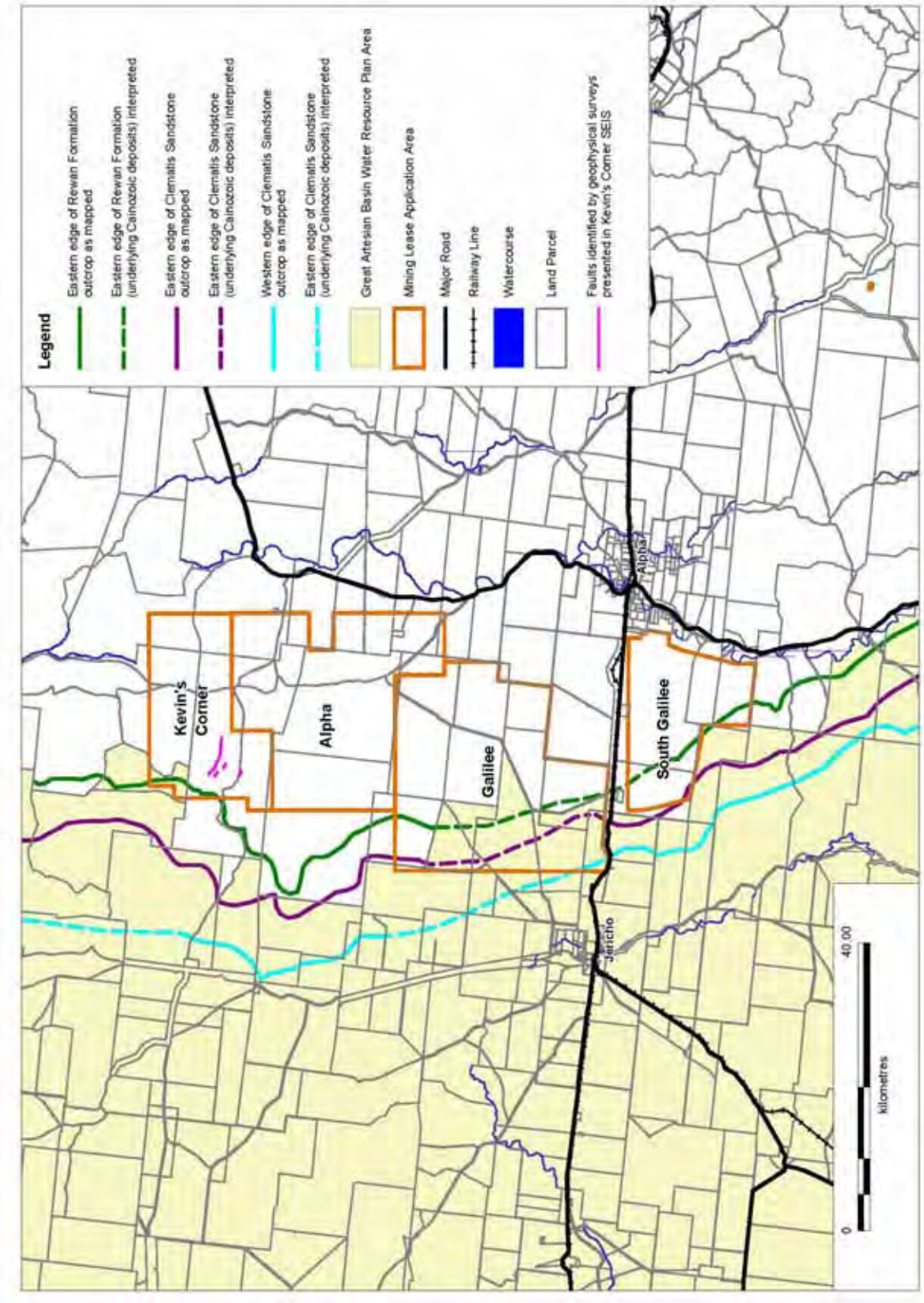


Figure 5.2 **Minor faults (based on seismic data) in relation to mining lease and geological boundaries**

Two faults of limited extent are mapped on GSQ's Jericho Geological Map to the west of the mining lease boundary. One is located within the Rewan Formation and to the east of the Clematis Sandstone outcrop and the second is predominantly located in the Rewan Formation and potentially protrudes into the edge of the Clematis Sandstone outcrop (where the Clematis Sandstone aquifer is unlikely to exist). However, no information is provided in GSQ's map explanatory notes as to the nature of these faults.

The first fault contained wholly within the Rewan outcrop and located closest to the mine site is shown as intersecting the Kevin's Corner and cumulative (Alpha Coal and Kevin's Corner) 5-metre drawdown contour with the drawdown contour being for the water contained within the D coal seam.

The second fault referred to above is located outside the 1-metre drawdown contour. DNRM advises that for there to be any possible connection, the faults would need to extend through the Rewan and Bandanna Formations. As the Clematis Sandstone aquifer is not present above the Rewan Formation in the location of the fault within the drawdown contours shown on the map, no connection could be made.

Based on the SEIS groundwater modelling results, which predict that the closest GAB aquifer (Clematis Sandstone) will not be impacted by the Kevin's Corner or Alpha Coal projects, and given there is only a possibility of minor faults, DNRM considers that the project is unlikely to impact the GAB aquifers.

Coordinator-General's conclusion

I accept DNRM's advice that the groundwater modelling provided as part of the SEIS (Appendix L: Groundwater Report) adequately provides for the predictive analysis of groundwater impacts arising from both Kevin's Corner and the adjacent Alpha Coal mines over the life of these projects.

I am therefore satisfied that the proponent's groundwater assessment provides a comprehensive predictive analysis of potential groundwater impacts, and that mine dewatering and depressurisation required for the project is unlikely to result in impacts to the GAB.

As a precautionary approach and based on advice from DNRM, in order to identify any unforseen impacts that may be caused by the mining operations, I have made a recommendation (Appendix 4, Recommendation 2) for the monitoring of groundwater levels in the Rewan Formation and Clematis Sandstone. I have also recommended that the proponent provide to DNRM an assessment of:

- the baseline level (natural groundwater level) in each monitoring bore constructed within the Clematis and Rewan Formations (based on at least 12 months of baseline monitoring data)
- appropriate trigger levels (lower and upper impact levels) for the early detection of induced flow from GAB aquifers (Appendix 4, Recommendation 3).

In accordance with my recommendations, in the event that the lower trigger level (low impact) is reached in any Rewan Formation or Clematis Sandstone bore, the proponent must notify DNRM within 30 days and conduct an investigation into the causes of the lower water levels (Appendix 4, Recommendation 3).

If the upper trigger level (high impact) is reached, the proponent must complete an independent investigation to determine the cause and provide a written report to DNRM within 30 days (Appendix 4, Recommendation 3). If found to be caused by the proponent operations, the proponent would be required to fully investigate and model the potential impact upon the GAB and obtain any necessary approvals as a result.

Refer to Appendix 5: Response to IESC advice, for further information.

5.1.4. Mine dewatering impacts on groundwater security

Context

The main groundwater resources in the MLA area are associated with the Permian Sandstone (Bandanna Formation and Colinlea Sandstone) and to a lesser extent the coal seams. Perched seasonal aquifers occur within the restricted alluvium deposits (clay-rich sediments) across the MLA, adjacent to the main creeks and rivers. Groundwater level data collated from monitoring bores across the MLA indicate no hydraulic connection between the perched seasonal aquifers and underlying groundwater resources.

The main groundwater use within the vicinity of the MLA is domestic use and stock watering.

Potential impacts and mitigation

Project groundwater drawdown contours indicate that there would be minimal drawdown to the east of the mine footprint due to the aquitard nature of the Joe Joe Formation shale. This low permeability unit restricts groundwater drawdown to the east. Drawdown cones elongate north and south, within the more permeable Colinlea Sandstone.

LOM drawdown predictions identify a total of 18 landholder bores to be 'at risk' of mine dewatering (refer to Figure 10-14, SEIS, Appendix L). 'At-risk' bores included 16 DNRM registered bores and 2 non-registered bores. These bores are located on properties to be acquired by the proponent as part of the Alpha or Kevin's Corner mining leases with the exception of two bores located on the CRR. Cumulative drawdown predictions identify an additional 10 landholder bores to be 'at risk' of mine dewatering (7 DNRM registered bores and 3 non-registered bores—refer to Figure 10-15, SEIS, Appendix L). These bores would be impacted by the Alpha Coal project (alone) and would require 'make good' arrangements to be provided as part of the Alpha Coal project mining lease. Refer to section 5.1.7 for more information on cumulative groundwater impacts of the project.

Long-term (post-mining) predictions indicate that groundwater levels would not recover to pre-mining levels adjacent to the project, thus the groundwater resources would be 'mined' from the Permian Sandstone and permanently lost.

Due to safety requirements, the Kevin's Corner and Alpha Coal projects would require the unavoidable removal of water from mine workings for the life of the mines. Accordingly there is very little in terms of mitigation against the potential impacts of drawdown that can be employed.

Under the Water Act, DNRM has authority to ensure that any water licence issued for mine dewatering contains 'make good' provisions so that all impacts on landowner groundwater supplies are addressed in a negotiated process with the affected landowners.

The proponent has commenced discussions with all landholders predicted to be impacted by mine dewatering regarding future 'make good' water supply agreements, including those landowners predicted to be affected by cumulative drawdown impacts. Alternative water supply strategies are likely to include:

- lowering pumps within an existing borehole, or supplying pumps with a greater head capacity if required
- drilling new bores to a greater depth to intersect the sub-E sandstone unit within the Colinlea Sandstone or lower aquifers, which are not a target of dewatering by the operation
- providing replacement bores for affected landholders so that the new bores are able to continue to supply water for the maximum predicted impacts of mining on water level.

An assessment of mine dewatering impacts on the sub-E sandstone groundwater supply (through induced flow from the sub-E sandstone to the dewatered and depressurised overlying units) confirmed that this aquifer could be utilised, away from the immediate mining area, as a source of 'make good' water (refer to section 13.3.5, Appendix L of the SEIS).

In its submission on the SEIS, DNRM acknowledged the proponent's commitment to enter into 'make good' agreements with landowners predicted to be impacted by groundwater drawdown, however requested that the proponent ensure these agreements are made prior

to the commencement of mining. The proponent has included a commitment to this effect in its Proponent Commitment Register (Commitment 12.12, Appendix 7 of this report).

Coordinator-General's conclusion

I note the proponent's commitment to 'make good' all impacts (including the cumulative impacts of the Kevin's Corner and Alpha Coal projects) on landowner water supplies, and that the proponent has already commenced discussions with affected landowners.

The proponent's 'make good' provisions would be addressed in detail as part of conditions attached to any approval for a licence under the Water Act, including:

- existing water supplies to be protected
- unduly affected water supplies to be restored
- agreements with bore owners on appropriate restoration measures (including the licensee bearing the cost of restoration measures)
- urgent restoration, monitoring and assessment, reporting and mine closure requirements.

Nevertheless, to ensure that local landholders are compensated for any impacts caused by mine dewatering, I have recommended that, prior to the commencement of mining activities, the proponent develop to the satisfaction of DNRM a plan to ensure the long-term security of water for all current groundwater users predicted to be affected by the project (Appendix 4, Recommendation 1).

I note from the SEIS (Appendix I: Off Lease Assessment) that the source of the project's water supply would be supplemented from groundwater during the first four years of mine construction and operation and that an external water supply would not be required until year five. Whilst groundwater modelling indicates that sufficient groundwater resources would be available for this purpose, the proponent would need to obtain a water licence issued under the Water Act prior to commencing any mining activities, which would include conditions to address the interception, availability and use of groundwater.

Based on the proponent's assessment of potential groundwater impacts and commitment to enter into 'make good' agreements with affected landowners prior to the commencement of mining activities, future approvals required under the Water Act and the recommendations included in my report, I am satisfied that local landholders would be appropriately compensated for any impacts caused by mine dewatering required for the project.

5.1.5. Mine dewatering impacts to registered springs, stygofauna and vegetation communities

Registered springs

Registered springs are located approximately 25 km to the north of the MLA boundary. Groundwater modelling presented in the SEIS (Appendix L) predicts no changes to groundwater levels in any of the model layers below the northern registered springs during the LOM or post mining.

Stygofauna

Previous studies identified the presence of one species of stygofauna in a bore within the alluvial planes of the Native Companion Creek situated 5 km to the south-east of the MLA and 13 km from mining activities. Groundwater drawdown predictions indicate that dewatering does not extend to the east, across or through the Joe Joe Formation aquitard, due to the limited groundwater potential of this unit. Accordingly, it is unlikely that these populations of stygofauna would be impacted by the proposed mine dewatering and depressurisation.

Vegetation communities

The groundwater assessment presented in the SEIS (Appendix L) did not identify any groundwater-dependent ecosystems on the project site, and the groundwater piezometeric levels associated with usable aquifers are at depths greater than 20 m and are thus not accessible to existing vegetation. Groundwater test-bore data indicates that there is no hydraulic connection (linkage) between the piezometeric groundwater levels (associated with the underlying confined aquifers) and the ephemeral surface water resources or perched water tables. Thus, it was concluded that any reduction in piezometeric pressure, resulting in a decrease in groundwater levels due to mine depressurisation, would not impact on vegetation communities.

The proponent has identified isolated perched groundwater aquifers, during and immediately after the wet season, within the clay-rich alluvium sediments where groundwater has been recorded at depths of 0.5 and 1.5 m below the surface. These perched water tables may provide limited water (low sustainable volumes) for local vegetation communities. There is potential for water to flow from the perched water tables into the mine voids which may impact these vegetation communities. The SEIS predicts that there will be a 10–100 m zone of influence directly around the mine void above the perched aquifers based on low gradients and low (clay-rich) permeability. The areas affected coincide with those to be cleared for the provision of infrastructure and access. It is therefore unlikely that any additional areas of vegetation will be impacted as a result of drainage of perched water tables.

The SEIS indicates that riparian vegetation in the project area includes *Eucalypt spp*. which can have a vertical root depth of up to 10 m. Testing and modelling undertaken as part of the groundwater assessment determined that the riparian communities within the project area are either ‘opportunistically dependent on regional groundwater, or without apparent dependence on regional groundwater’ (SEIS, Appendix L). Riparian vegetation is therefore not considered to have a strong dependence on groundwater and is unlikely to be impacted by changes to groundwater that may occur as a result of the project.

Coordinator-General’s conclusion

Based on the additional groundwater modelling and risk assessment provided in the SEIS, I am satisfied that mine dewatering and depressurisation required for the project is unlikely to result in impacts on registered springs or stygofauna.

I am satisfied that the project would only result in minor additional impacts on vegetation communities reliant on perched water table supply, as these vegetation communities coincide with those areas to be cleared for the provision of infrastructure and access. I note that provisions to offset likely adverse residual impacts on vegetation communities that

provide high value habitat for protected species are outlined in the Kevin's Corner Biodiversity Offset Plan. Refer to section 5.3.5 and 8 of this report for more information on impacts on biodiversity.

5.1.6. Groundwater quality impacts

Increased aquifer connectivity associated with subsidence

Section 8.2.1 of the Interim Subsidence Management Plan (ISMP – SEIS, Appendix N) addresses interflow between aquifers. Cracks created during longwall mining would allow for the direct interconnection between units of differing hydrochemistry. The resultant blending of fresh, brackish, and saline water can result in an alteration of groundwater quality. Thus the resultant fracturing could potentially increase interconnection between units and the confining pressures could allow for groundwater movement between units.

Mine dewatering would reduce the impacts of this alteration on hydrochemistry as the composite groundwater would be used on site and would not result in aquifer through-flow from the site. Predictive post-mining model results indicate that groundwater will flow towards the final void at the neighbouring Alpha Coal Mine and not into regional aquifers or surface water systems. Further, site investigations show groundwater in the units overlying the targeted coal seams occurs as sporadic unconfined perched groundwater, and the units are not regarded as significant regional aquifers.

I have stated draft EA conditions (Appendix 1, Schedule C) requiring the comprehensive monitoring of groundwater hydrochemistry for 20 chemical and physical water quality parameters for comparison with contaminant trigger values for underlying aquifers (including Alluvium, Bandanna Formation, Colinlea Sandstone, Rewan Formation and Tertiary). If groundwater quality characteristics exceed any of the stated trigger values, the proponent must investigate the potential for environmental harm. DEHP advises it will respond to any non-compliance of EA conditions or unauthorised environmental harm and has the ability to use a number of enforcement measures in accordance with DEHP's Enforcement Guidelines.[13]

Tailings management

The majority of mining waste generated by the project would be overburden/interburden from the open-cut mining operations (approximately 3.15 billion tonnes over the LOM), supplemented by a relatively small quantity of coarse rejects and fine rejects (150 and 70 million tonnes LOM, respectively) from the CHPP.

Tailings would be placed into a purpose-built above-ground tailings storage facility for the first five to seven years of mining, followed by in-pit disposal of tailings into the northern pit for the remaining life of the mine. Appendix E of the SEIS presents a geochemical assessment of coal and mining waste materials associated with the Kevin's Corner project. The results of the geochemical assessment indicate that the bulk overburden/interburden material is Non-Acid Forming (NAF) and has a high factor of safety with respect to potential acid generation.

[13] http://www.ehp.qld.gov.au/management/pdf/enforcement-guidelines.pdf

To protect water resources, I have stated a number of draft EA conditions to ensure the effective assessment and management of mining waste (Appendix 1, Schedule F). A detailed mining waste assessment program will be required for the progressive characterisation of all mining waste prior to disposal, including for net acid producing potential, salinity, physical properties and a number of key contaminants (iron, aluminium, copper, magnesium, manganese, calcium, sodium and sulphate).

A Mining Waste Management Plan, to be developed and implemented prior to mining activities commencing, must address and include a CHPP Waste Management Plan, Tailings Management Plan and Mining Waste Emplacement Area Operational Plan. Plans must be reviewed and reported on each calendar year for adaptive management. The mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste (waste rock, spoil, overburden, tailings and course reject material) is appropriately confined and contained prior to decommissioning and rehabilitation (Appendix 1, Schedule F).

Coordinator-General's conclusion—groundwater quality impacts

Based on the proponent's assessment of groundwater quality impacts and the comprehensive requirements of the EA conditions, I am satisfied that the proponent would minimise and manage any potential impacts on groundwater quality.

5.1.7. Cumulative groundwater impacts

Context

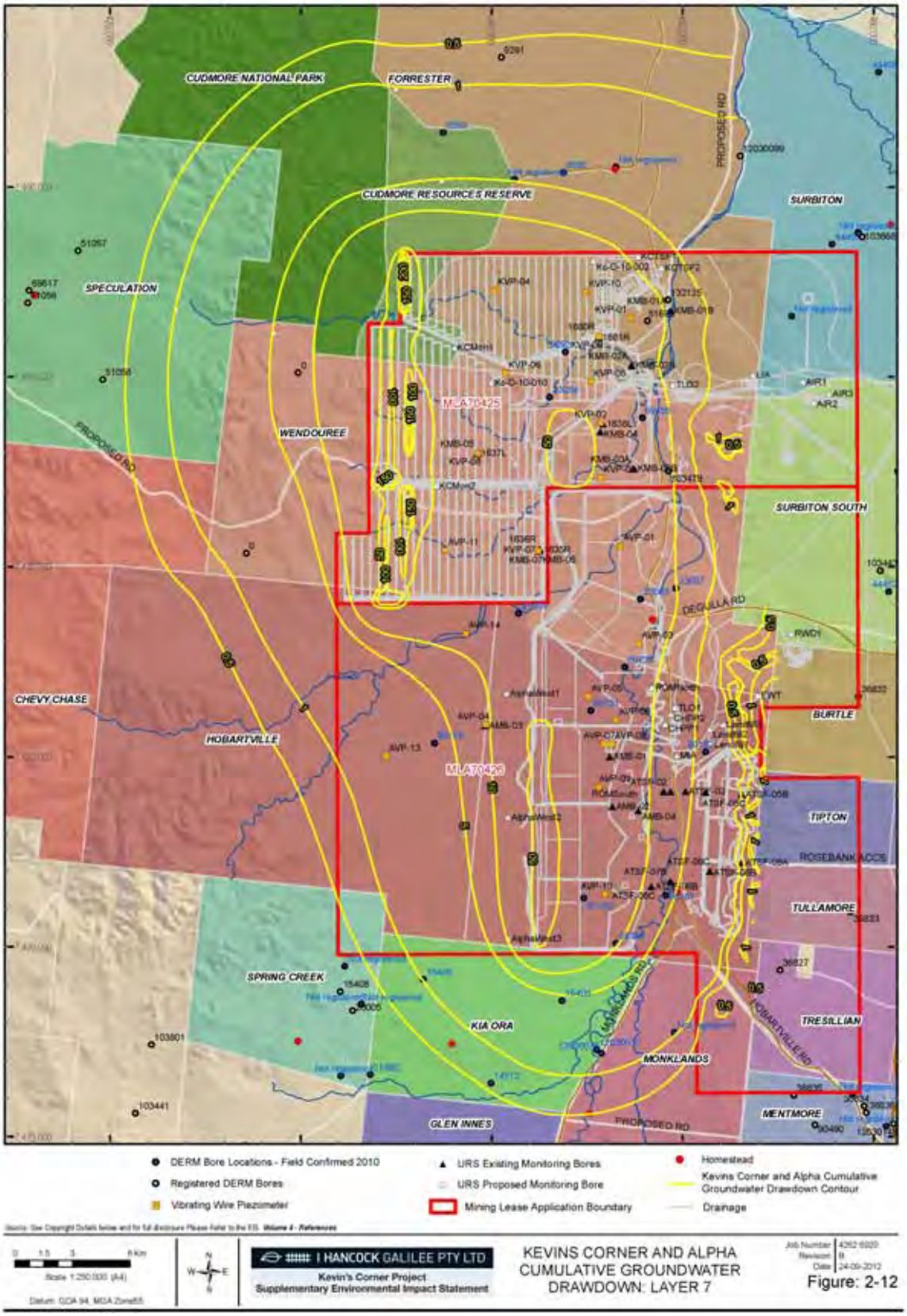
The Kevin's Corner project is located adjacent to the Alpha Coal project. Both projects would require aquifers immediately surrounding the targeted coal seams (all within the same Permian sediments) to be dewatered and depressurised to allow mining to occur safely.

In response to EIS submissions requesting the additional assessment of cumulative groundwater impacts, the proponent quantitatively assessed the cumulative impact of mine dewatering required for the Kevin's Corner project and adjacent Alpha Coal project using predictive groundwater modelling (SEIS, Appendices L and O).

As identified in section 5.1.2, DNRM advises that the SEIS groundwater modelling adequately provides for the predictive analysis of groundwater impacts arising from both Kevin's Corner and the adjacent Alpha Coal mine over the life of these projects.

Cumulative impacts of mine dewatering

The cumulative impact of adding the Alpha Coal Project mining operation to the Kevin's Corner project, results in deeper drawdown (where drawdown cones overlap) and further elongation along strike (north/south). These areas occur outside the Kevin's Corner MLA and are considered to increase the potential impacts on groundwater resources and users (refer to Figure 5.3).



Source: SEIS, Appendix O Cumulative Impacts Assessment, Figure O-8

Figure 5.3 Kevin's Corner and Alpha cumulative groundwater drawdown contours

The modelled cumulative drawdown contours do not indicate any additional or cumulative impact to the west. Rather, the cumulative drawdown only increases to the south of the Kevin's Corner MLA where the two drawdown cones overlap. This indicates that the risk to the GAB units to the west (Clematis Sandstone) is not increased by additional mining projects along strike of one another. The Joe Joe Formation aquitard (based on drilling and aquifer assessments) limits drawdown to the east, regardless of projects or location.

There is no impact predicted for registered springs to the north or west, when considering the Kevin's Corner project alone or with the Alpha Coal project being mined concurrently (section 4.2.6, SEIS, Appendix O). Apart from those areas of vegetation communities reliant on perched water table supply, which coincide with those areas to be cleared for the provision of infrastructure and access, no significant direct or indirect cumulative impacts are predicted on vegetation communities (section 4.2.9, SEIS, Appendix O). Accordingly, dewatering as part of the Kevin's Corner and Alpha Coal projects is not likely to result in habitat loss or impacts on ecological systems.

However, as identified in section 5.1.4, the cumulative impact of dewatering required for the Kevin's Corner and Alpha Coal projects would result in impacts to a larger area within the Colinlea Sandstone and affect long-term groundwater flow patterns and resources. In accordance with requisite water licence requirements under the Water Act, DNRM would require all project proponents to enter into 'make good' agreements with landholders predicted to be impacted by groundwater drawdown to ensure ongoing water supply.

To inform DNRM's consideration of potentially multiple water licence applications for mine dewatering in the Galilee Basin, DNRM advises that it has undertaken a preliminary regional scale assessment of the water balance of the eastern Galilee Basin.

DNRM considers the primary limitation of its preliminary groundwater assessment is the constraints to validation of assumptions, linked to the paucity of historical groundwater data for aquifers in the Galilee Basin. However, DNRM notes that estimates of mine impacts could be refined as more data becomes available through the operational stages of the mines. This data would then also progressively refine the basis for more comprehensive numerical modelling which would enable more robust assessment of impacts on specific water resources and environmental assets.

Coordinator-General's conclusion

I accept DNRM's advice that the groundwater modelling provided as part of the SEIS (Appendix L: Groundwater Report) adequately provides for the predictive analysis of groundwater impacts arising from both Kevin's Corner and the adjacent Alpha Coal Mine over the life of these projects. I note the proponent's commitment to 'make good' the cumulative impacts of the Kevin's Corner and Alpha Coal projects on landowner water supplies, and that the proponent has already commenced discussions with affected landowners.

In order to complement DNRM's preliminary water balance assessment and contribute to the ongoing adaptive management of water resources in the eastern Galilee Basin, I have recommended that DNRM develop and maintain a numerical regional water balance model (RWBM) (Appendix 4, Recommendation 7) which should:

- identify linkages between hydrogeological formations, the likely extent of aquifer connectivity and groundwater/surface water interactions, and characteristics of aquifer recharge
- use baseline monitoring and site water balance model data provided by project proponents
- have regard to relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin
- determine potential impacts on groundwater resources and surface water flow conditions, environmental values and existing surface water users.

To properly address any cumulative impacts on water resources, including groundwater resources, I have also recommended the development of a regional groundwater and surface water monitoring and assessment program (Appendix 4, Recommendation 9) that would utilise the results of the baseline RWBM (Appendix 4, Recommendation 7). The program, to be developed and maintained by DNRM in consultation with DEHP and Galilee Basin mine proponents, would:

- establish a protocol with mine proponents for the collation and delivery of surface water and groundwater monitoring data
- collate and overview surface water and groundwater monitoring data recorded by project proponents in accordance with project approval requirements
- have regard to relevant key deliverables expected from the Australian Government's proposed bioregional assessment for the Lake Eyre Basin
- adopt a risk-based assessment of regional cumulative impacts based on data provided and impact assessment reports prepared by project proponents, including potential impacts on existing water users, aquatic habitat loss and impacts on ecological systems. Regional cumulative impacts include the impacts of proposed mining project activities, including but not limited to:
  - open-cut and underground mining operations
  - mine dewatering
  - mine waste management
  - stream diversions and flood levees
  - subsidence
- report on the success of water management measures and inform the ongoing adaptive management of water resources in the region
- periodically publish data and reports with reference to monitoring and assessment program outcomes.

I have also imposed conditions to ensure the proponent contributes to the regional groundwater and surface water monitoring and assessment program when it is established, including pro-rata funding (Appendix 3, Condition 2 and Condition 3).

5.2. Surface water

5.2.1. Introduction

The project site is located in the Sandy Creek catchment, which is a tributary of the Belyando River within the greater Burdekin River Basin. The area of the study catchment (to the northern lease boundary of the project) is approximately 2740 km^2. The Kevin′s Corner project would involve modifications to surface water hydrology through the diversion of Little Sandy and Rocky Creeks into Middle Creek and the capture of 33.94 km^2 of catchment within the mine water management system. In addition, modifications to the floodplain would occur through the construction of a diversion levee, central open-cut levee, northern open-cut levee and a train load-out facility levee.

Submissions on the EIS and SEIS raised a number of issues in relation to potential surface water impacts, including:

- impacts on surface water hydrology and geomorphology, including the risk of flooding
- impacts on subsidence
- impacts on surface water quality, including discharge of mine-affected water, mine waste management and monitoring
- cumulative surface water impacts.

I have considered each of the submissions and how the SEIS and subsequent information received from the proponent has responded to submitter issues in evaluating the environmental impacts of the project.

As noted in section 3.7 of this report, advice received from the IESC has informed my evaluation of the Kevin's Corner project. I consider the following items of the IESC advice to be relevant to my evaluation of potential surface water impacts:

- Concerns regarding the proponent's discharge strategy and release limits (items 6, 7, 11(a) and 11(b)). Section 5.2.4 of this chapter provides a response to this item.
- Potential for subsidence to alter surface–groundwater connectivity (item 9) Section 5.2.5 of this chapter provides a response to this item.
- Changes to flood hydrology and the resultant impact on vegetation community composition (items 8 and 10). Section 5.2.3 of this chapter provides a response to this item.
- Developing a site and regional water balance model (RWBM), and the risk based-assessment of cumulative impacts (item 3). Section 5.2.6 of this chapter provides a response to this item.

A consolidated response to the IESC advice is provided in Appendix 5 of this report.

5.2.2. Assessment methodology

A number of assessment studies were undertaken for the surface water section of the EIS (section 11), including:

- Geomorphology Assessment (EIS Appendix M1)

- Flood Hydrology Study (EIS Appendix M2)
- Hydraulics Technical Report (EIS Appendix M2)
- Site Water Management System and Site Water Balance Assessment (EIS Appendix M3)
- Surface Water Quality Technical Report (EIS Appendix M4).

In response to submissions received on the EIS, the SEIS included a number of revised or new assessment studies to more comprehensively assess potential impacts on surface water resources, including:

- Off Lease Assessment Report – section 3: Water Assurance (SEIS Appendix I)
- Revised Surface Water Hydraulics Report (SEIS Appendix K)
- Site Water Management (Basis of Design) Report (SEIS Appendix M), including an updated site water balance
- Interim Subsidence Management Plan (SEIS Appendix N)
- Cumulative Surface Water Impact Assessment (SEIS Appendix S)
- Cumulative Impact Assessment Report (SEIS Appendix O).

5.2.3. Surface water hydrology and geomorphology

The proposed hydrological modifications caused by flood prevention levees have the potential to change surface water flows (flood risk) and drainage flow paths, which in turn may impact on the existing geomorphology of the area.

Surface water hydrology

Hydraulic modelling[14] for the baseline and developed (with mine) scenarios predicted that, despite an increase in flood levels of up to 1.1 m during a 1:1000 AEP event, no significant changes to the area of flooding or duration would occur from the construction and operation of the project (excluding those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure). This is due to the restriction of the area of flood waters between levees, which would traverse the left bank of Sandy Creek, and the relatively steep natural topography on the right bank of the channel that spans the area of increased water level.

Areas of prolonged inundation (i.e. surface water ponding) are predicted associated with subsidence from proposed underground mining. Refer to section 5.2.5 for details of subsidence-related impacts on hydrology.

The Kevin's Corner project and adjacent Alpha Coal project together involve a number of creek diversions and flood levees which may result in cumulative flooding impacts. The cumulative impact assessment of both projects (SEIS, Appendix S) determined that flood levels within the Kevin's Corner mining lease may increase by up to 90 mm (in addition to the 1.1 m increase predicted for the Kevin's Corner project) and result in an equivalent afflux at the upstream (Alpha Coal project) lease boundary. However, flood protection for the Kevin's Corner project has been designed with a one-metre freeboard above the 1:1000 AEP flood

[14] SEIS Appendix K: Revised Surface Water Hydraulics Report

level (of 1.1 m), which is considered adequate to prevent inundation of the project site (including completed longwall panels) from a 90 mm increase in water levels.

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, a comparison of the cumulative flood extent with the modelled baseline scenario shows no significant change in the area of flooding or duration. Modelling has shown that with both the Alpha and Kevin's Corner projects in place, there would be a minor reduction (69 ha) in the area flooded for greater than 96 hours compared to the baseline scenario. The reduction in flooding is minor in scale and applies only to major flood events, and is therefore not likely to result in adverse impacts on species or habitats (refer to section 5.3 of this report for more information).

Geomorphology

Hydraulic modelling indicates that the proposed diversion should achieve the adopted design criteria and would not be expected to result in any significant detrimental hydro geomorphology impacts on the Little Sandy Creek, Rocky Creek, and Middle Creek system. Nonetheless, some possible impacts include:

- erosion of the diversion channel due to flooding before protecting vegetation has had sufficient time to become established
- excessive sedimentation within the diversion channel due to a reduced longitudinal gradient resulting in reduced flood capacity within the channel system, which could reduce the flood immunity rating of the flood protection levees

The cumulative impact assessment of the Kevin's Corner and Alpha Coal projects (SEIS, Appendix S) predicts no increases to stream flow, velocity or power within the Kevin's Corner MLA beyond that predicted for the Kevin's Corner project. This indicates that there is not likely to be a cumulative impact on erosion and sedimentation rates within the Kevin's Corner MLA.

Mitigation measures

The Environmental Management Plans (EMPs) for the project outline a range of control strategies and commitments to manage and mitigate potential impacts on surface water hydrology and geomorphology during construction and operation. Key mitigation measures include the following:

- adopt best practice erosion and sedimentation control measures across the project area
- prepare and implement an Erosion and Sediment Control Plan (a proposed outline is provided in SEIS Appendix T4.04) that would detail the design of erosion control measures to prevent topsoil leaving the site, and requirements for regular erosion monitoring of vegetation establishment in rehabilitation areas
- establish vegetation on disturbed areas of diversions as soon as practicable before commissioning
- replicate substrate conditions for geomorphic processes, water quality, vegetation, and aquatic habitat features in diversion active channels to allow for similar conditions to the existing stream substrate conditions
- design hydraulic performance including channel velocities, stream power and shear stress in accordance with the Australian Coal Association Research Program (ACARP) (2002)

Maintenance of Geomorphic Processes in Bowen Basin River Diversions – Final Report, Research Projects C8030 and C9068[15]

- develop and implement a comprehensive Stream Diversion Monitoring Program
- construct flood levees to protect the open-cut pits from flooding for events up to 1:1000 AEP
- monitor deposition and erosion at fixed control locations with periodic (e.g. bi-annual) photographic surveys of the diversion channel; confluences with Little Sandy Creek, Rocky Creek, and Middle Creek; and existing Middle Creek and Well Creek channels downstream of the diversion channel
- investigate the cause and identify evidence of impacts on the morphology of the creeks would trigger further investigations of the cause and identification of remedial strategies
- undertake a detailed assessment of sediment sources and stream sediment transport at the end of the mine life to determine whether mining-related impacts have been appropriately mitigated, and that the geomorphic systems can continue to function sustainably in the long-term prior to the mining licence being relinquished.

DNRM advises that, at this stage of the approval process, the proponent's assessment documentation sufficiently addresses the potential impact of the Kevin's Corner and Alpha Coal projects on local hydrology and geomorphology. Further information on the detailed design of the watercourse diversions and hydrological impacts would be required for both projects as part of future applications for licences required under the Water Act. In particular, the design of any diversion would need to be to acceptable engineering standards and in accordance with the *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*[16]*.* This requires that watercourse diversions replicate the geomorphic and riparian vegetation conditions of existing watercourses. These principles are also outlined in the ACARP report *Maintenance of Geomorphic Processes in Bowen Basin River Diversions, Stages 1, 2 & 3*.[17]

Coordinator-General's conclusion

I note DNRM's advice that, at this stage of the approval process, the proponent's assessment documentation sufficiently addresses the potential impact of the Kevin's Corner and Alpha Coal projects on local surface water hydrology and geomorphology.

I have stated a number of draft EA conditions in order to protect surface water hydrology and geomorphology values on the mine site (Appendix 1, Schedule G). These specify the comprehensive design requirements that must be addressed during the detailed design phase of the project in order to ensure regulated structures (i.e. dams and levees) protect mining areas under extreme weather events and prevent non-compliant discharge and environmental impacts on downstream receiving waters, ecosystems and landholders.

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[15] R Hardie & K White, *Maintenance of Geomorphic Processes in Bowen Basin River Diversions*, Final Report, Australian Coal Associated Research Program Project C8030-C9068, ID&A, Earth Technology, 2002.
[16] Department of Natural Resources and Mines, *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*, Department of Natural Resources and Mines, 2011.
[17] R Hardie & K White, *Maintenance of Geomorphic Processes in Bowen Basin River Diversions, Stages 1, 2 & 3*, Australian Coal Association Research Program Project C9068, ID&A, Earth Technology, 2001.

In order to minimise erosion and the release of sediment to receiving waters, I have also stated a condition requiring the implementation of an Erosion and Sediment Control Plan for all stages of the mining activities on the site (Appendix 1, Schedule C).

Based on the proponent's revised hydraulic modelling, mitigation measures provided in the EMPs for the project, DNRM's advice and the fact that future applications for licences would be required under the Water Act regarding watercourse diversions and hydrological impacts, I am satisfied that impacts on surface water hydrology and geomorphology are able to be appropriately managed and mitigated.

The proponent must implement the EMPs for the project in accordance with the EP Act (mine tenement) and conditions stated in Appendix 2 of this report (off-lease road and rail spur components).

5.2.4. Surface water quality

Potential impacts on surface water quality may arise from:

- land disturbance during construction
- stream channel erosion and destabilisation if stream diversions are not adequately designed, constructed or rehabilitated
- the uncontrolled or non-compliant release of potential contaminated water (e.g. from refuelling facilities, chemical storage facilities or through the failure of regulated structures associated with the project's mine water management system).

Mitigation

The Site Water Management (Basis of Design) Report (SEIS, Appendix M) details sufficient system capacity in the project's mine water management system such that there would be an extremely low probability of uncontrolled (spillway) discharge to the receiving environment (1:100,000 AEP[18]). Key design features include directing any spillway discharges into internal receiving structures such as the open-cut pits, and providing for significant contingency mine water storage (in the form of mine water dams 3 and 4).

Other key measures to mitigate impacts on surface water quality, as outlined in the EMPs for the project, include the following:

- implement storm water controls in accordance with the *Queensland Urban Drainage Manual*, *Australian Runoff Quality – A guide to water sensitive urban design*
- design all fuel and chemical storages in accordance with relevant Australian Standards to minimise the potential for land and water contamination from spills and leaks
- collect and treat sewage waste generated during the project to Class A+ effluent quality on-site
- implement a water management system and discharge strategy to manage water flows onto, within and from the site in order to safeguard mine operations and minimise the project impacts on downstream water quality
- identify and regulate all potential uncontrolled release points from the project as release points into the receiving environment

[18] The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year

- implement a Water Quality Monitoring Program to monitor and record the effects of the release of contaminants on the receiving environment with the aims of identifying and describing the extent of any adverse impacts on local environmental values, and monitoring any changes in the receiving water
- implement an Erosion and Sediment Control Plan (SEIS, Appendix T4.04) prior to commencement of construction works
- minimise the use of pesticides within the rail loop corridor and only use pesticides with low residual impacts
- immediately clean up any coal spills.

DEHP has advised that the proponent's assessment documentation, including the updated technical documents presented as part of the SEIS, provides an adequate assessment of potential surface water quality impacts. The Department of Science, Information Technology, Innovation and the Arts (DSITIA) has reviewed the proponent's discharge strategy (developed in accordance with the draft EA conditions stated in Appendix 1). DSITIA concurs that the strategy would ensure the protection of environmental values of receiving waters in accordance with the Environmental Protection (Water) Policy 2009 and relevant guidelines that provide water quality objectives to protect these values.

Assessment of background data was used by the proponent as a basis for proposed release contaminant trigger levels for metals above the default guideline levels.[19] These levels can only be modified in those cases where the 80th percentile of background site data is significantly different to the default ANZECC trigger. This generally occurs in areas where the natural mineralogy elevates the concentrations of toxicants to comparatively high levels and needs to be demonstrated for each parameter. Both minimum site data and criteria indicated in Section 4 of the *Queensland Water Quality Guidelines* need to be considered in the derivation of local water quality guidelines.[20] Modified trigger values have subsequently been developed using data collected by the proponent in accordance with these methods.

Coordinator-General's conclusions

I note DEHP and DSITIA's advice that the proponent's assessment documentation sufficiently addresses the potential impact of the project on surface water quality.

I have stated a number of draft EA conditions in order to protect surface water quality values (Appendix 1, Schedule C). The conditions set receiving environment monitoring and contaminant trigger levels at upstream (background or baseline) and downstream monitoring locations. If quality characteristics of the receiving water at the downstream monitoring points exceed any specified trigger level during a release event, the proponent must compare the downstream results to upstream results in the receiving waters and, where exceedences are identified, investigate the potential for environmental harm, including actions taken to prevent environmental harm and correct the problem.

Appropriate monitoring timeframes have been included in the draft EA conditions referred to above. Two forms of monitoring are required: compliance monitoring and the Receiving

[19] ANZECC and ARMCANZ trigger values for Slightly or Moderately Disturbed Systems; or limits of reporting (LOR) where analytical methods are not sufficiently sensitive.
[20] *Queensland Water Quality Guidelines 2009:* http://www.ehp.qld.gov.au/water/guidelines/queensland_water_quality_guidelines_2009.html

Environment Monitoring Program (REMP). Monitoring frequencies related to discharge and compliance monitoring have been defined including daily monitoring for discharges, trigger investigation levels and receiving waters contaminant trigger levels.

Based on the proponent's mitigation measures provided in the EMPs for the project, the requirements of the draft EA conditions and advice received from DEHP and DSITIA, I am satisfied that impacts on surface water quality would be manageable. Should any surface water discharge be required in specified cases, I am satisfied that discharges made in accordance with the conditions would not result in significant adverse impacts on environmental values.

The proponent must implement the EMPs for the project in accordance with the EP Act (mine tenement) and conditions stated in Appendix 2 of this report (off-lease road and rail spur components).

5.2.5. Subsidence impacts

Potential impacts

The proponent's assessment of potential impacts from subsidence is provided in the ISMP (SEIS, Appendix N). Potential impacts on surface water resources from subsidence include:

- impacts on catchment boundaries, potentially resulting in self-contained catchment areas where water that would formerly have run off to the creek channels prior to subsidence would now pool within the subsided area and be lost to groundwater due to percolation (i.e. ponding)
- loss of surface water flow through surface cracking
- change to stream bed profiles between longwall panels, resulting in erosion between adjacent longwall panels and sedimentation over the tops of the longwall panels
- potentially reduced flood capacity in channels due to increased sedimentation, resulting in more frequent inundation of floodplain areas
- reduced stability of the proposed diversion channel due to subsidence.

Refer to section 5.1 of this report for my assessment of potential impacts on groundwater resources from subsidence.

Over the 30-year life of the mine, subsidence is predicted to result in a total of 109 ponds of varying area, depth and lifespan forming above the northern and southern sections of the underground mine areas in addition to Well Creek, Middle Creek, Rocky Creek and Little Sandy Creek. These ponds would occur sequentially as underground mine operations move from east to west.

Crack widths are predicted to range from 4–40 mm to 19–190 mm in the Northern Underground Mine area, from 6–60 mm to 14–140 mm in the Central Underground Mine area, and from 7–70 mm to 16–160 mm in the Southern Underground Mine area. Modelling of tension zones and surface cracks (refer to section 3.2 of ISMP) is considered a worst-case assessment as it is based on an overburden composed wholly of intact bedrock and does not take into account the Tertiary and Quaternary sediments which overlay much of the project area (clay-rich with an average thickness of 40 m).

Surface cracking may provide a conduit for channel flow to percolate into the cracks and voids with a resulting loss of stream flow. Section 9.3 of the ISMP notes that percolation would need to be very rapid in order to significantly reduce the flood flows responsible for geomorphic change in the channel. Additionally, the Tertiary and Quaternary age alluvium that underlies the surface is not likely to suffer the same extent of cracking as would be the case for intact bedrock. As a consequence, the ISMP considers that the potential cracking effects on flood flows are not likely to have geomorphic significance.

Mitigation

The mine EMP and ISMP outline a number of pre-subsidence measures that would be implemented when applicable within the bed and banks of watercourses to minimise the potential for adverse subsidence impacts. Key pre-subsidence measures include:

- installing timber groynes/pile field retards at the base of the channel banks (extending into the channel) to mitigate erosion undercutting the channel banks and to facilitate creation of in-channel benches
- proactive excavation of pillar zones from creek channels (e.g. construction of excavated trapezoidal drainage channels) to facilitate natural drainage of significantly ponded areas (i.e. those which are considered to have potential to cause ponding to occur for a period of greater than six months)
- designing local drainage works to prevent the uncontrolled flow of runoff from the subsided floodplain area over the channel banks. This would include the use of subsidence troughs to trap sediment and small diversion bunds to direct floodplain runoff to properly engineered rock chute structures
- providing a cover of topsoil in a weathered rock matrix to create a stable substrate for the revegetation of channel banks. Weathered rock provides temporary erosion protection by covering erodible soils and minimising topsoil loss
- excluding cattle to a width of at least 30 m from the top of bank and subsided floodplain areas in order to minimise further impacts on vegetation cover and land condition.

Over the 30-year period of underground mining, the proponent would implement a comprehensive monitoring program of subsidence (pre- and post-subsidence) including an assessment of the success of mitigation measures. Impacts would be modelled in five-year stages and results of annual monitoring would be reported at the end of each five-year period to document what has actually occurred, and if the modelled extent of impacts was accurate.

Post-subsidence monitoring would determine the extent and type of mitigation measures that may be required to manage adverse subsidence impacts, using measures identified in the ISMP and Mine EMP. Key post-subsidence measures that would be implemented on an ‘as needed’ basis include:

- replacement of sand across the channel bed, including higher sand deposits suitable for re-creating in-channel benches
- in areas where less active bank erosion develops, the placement of large woody debris in-stream to encourage the deposition of sediment and revegetation over time
- targeted revegetation in areas where surface water patterns have been affected or natural regeneration has not stabilised active bank erosion

- ripping and seeding of persistent cracks (i.e. those which have persisted beyond three storm events or have led to increased inflows into the mine workings). This would be supplemented with grouting treatments such as bentonite injection or placement of sand in the event that losses continued to occur
- remedial works to reinstate an evenly graded bed profile in the event that natural channel erosion and sedimentation does not reduce the volume of channel bed depressions (and consequent ponded water volumes)
- assessment of levee embankments for cracking and reconstruction where cracking has the potential to reduce the 1:1000 AEP flood immunity.

The proponent has committed to implement a range of management actions to mitigate subsidence impacts on vegetation communities (refer to Table T-12 of the Mine EMP). Sections 5.3 and 8 of this report provide information on the impacts of subsidence on ecological communities.

Coordinator-General's conclusion

I have stated a number of draft EA conditions (Appendix 1, Schedule F) to ensure the proper and effective management of subsidence impacts over the 30-year life of the mine. Prior to the commencement of activities that result in subsidence, a final Subsidence Management Plan must be implemented detailing mitigation measures and a program for monitoring and adaptive management. The effectiveness of the plan must be reviewed and reported on annually by the proponent and provided to DEHP, including recommended actions to ensure actual and potential impacts are effectively managed for the coming year.

Based on the predictive subsidence modelling completed for the SEIS (Appendix N), the measures contained within the Mine EMP and ISMP to monitor and mitigate the impacts of subsidence, and the requirements of the draft EA conditions, I am satisfied that the potential impacts of subsidence would be appropriately managed.

The proponent must implement the EMPs for the project in accordance with the EP Act (mine tenement) and conditions stated in Appendix 2 of this report (off-lease road and rail spur components).

5.2.6. Coordinator-General's recommendations to address cumulative surface water impacts

As identified in section 2 of this report, projects in the vicinity of the Kevin's Corner project to be considered in terms of cumulative impacts include the Alpha Coal Project (Hancock Coal Pty Ltd), Galilee Coal Project (Waratah Coal Pty Ltd) and South Galilee Coal project (AMCI Pty Ltd). If all these proposed projects were ultimately to proceed, it is anticipated that tributaries to the Burdekin Catchment would be dissected by mines along a coal strike of approximately 100 km.

Whilst the proponent has assessed cumulative surface water hydrology impacts (refer to section 5.2.3 of this chapter and SEIS Appendices S and O), the scope of the assessment was limited to the Kevin's Corner and Alpha Coal projects. This was because these were the only projects sufficiently progressed within the public arena that enabled a quantitative assessment when the SEIS was prepared.

Mining activities for the Kevin's Corner project can only proceed on the proposed mining lease in accordance with an EA issued under the EP Act. The authority sets conditions that must be complied with to protect the environment. However, the EA can only apply to activities on the mining lease and does not regulate potential project impacts arising from multiple mining activities in the Galilee region.

DEHP has noted that, in light of the multiple mines proposed for the Galilee Basin, it would be preferable to establish a regional surface water monitoring and reporting program similar to that operating in the Bowen Basin. Advice received from the IESC also recommended the development of a RWBM, and the risk based-assessment of cumulative impacts (item 3). This work goes beyond individual proponent responsibility, and I consider this should be the responsibility of the state government as part of its ongoing management of water resources in the region.

Accordingly, to address potential cumulative impacts on water resources in the Belyando-Suttor sub-catchment and the aquifers of the eastern part of the Galilee Basin[21], I have made several recommendations to relevant state government departments for the development and maintenance of a RWBM (Appendix 4, Recommendation 7), local water quality objectives (Appendix 4, Recommendation 8) and a Regional Groundwater and Surface Water Monitoring and Assessment Program (Appendix 4, Recommendation 9).

Section 5.1 of this report identifies my recommendation for DNRM to develop and maintain a numerical RWBM for the eastern Galilee Basin (Appendix 4, Recommendation 7). The RWBM will complement the preliminary water balance assessment recently undertaken by DNRM, have regard to relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin and contribute to the ongoing adaptive management of water resources in the eastern Galilee Basin.

To address potential cumulative impacts on water resources, section 5.1 of this report also includes my recommendation for DNRM to develop and maintain a Regional Groundwater and Surface Water Monitoring and Assessment Program (Appendix 4, Recommendation 9) that will utilise the results of the RWBM (Appendix 4, Recommendation 7).

The Regional Groundwater and Surface Water Monitoring and Assessment Program will be based on data provided and impact assessment reports prepared by project proponents, and adopt a risk-based assessment of regional cumulative impacts, including impacts on existing water users, aquatic habitat loss and impacts on ecological systems. Regional cumulative impacts will include the impacts of proposed mining project activities, including but not limited to:

- open-cut and underground mining operations
- mine dewatering
- mine waste management
- stream diversions and flood levees
- subsidence.

I have also imposed conditions to ensure the proponent contributes to the program when it is established, including pro-rata funding (Appendix 3, Condition 2).

[21] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.

In order to address potential cumulative impacts on surface water quality, I have recommended that DEHP develop Belyando-Suttor sub-catchment environmental values and water quality objectives pursuant to the provisions of the Environmental Protection (Water) Policy 2009 (Appendix 4, Recommendation 8). The development of water quality objectives will have regard to:

- the baseline monitoring and site water balance model data provided by project proponents
- relevant key deliverables expected from the Australian Government's proposed bioregional assessment for the Lake Eyre Basin
- the results of the RWBM (Appendix 4, Recommendation 7)
- the ongoing regional surface water and groundwater monitoring and assessment program (Appendix 4, Recommendation 9).

DEHP advises that work is already underway to address Recommendation 8.

5.3. Biodiversity

5.3.1. Introduction

This section of the report provides an assessment of state significant biodiversity values[22] (SSBV) that may be impacted by the project, including MNES values where they correspond with SSBV matters. For further discussion on MNES affected by the project, refer to section 8 of this report.

Submissions received on the EIS and SEIS raised a number of issues in relation to biodiversity, including:

- the adequacy of flora and fauna surveys
- impacts associated with vegetation clearing, including alteration to habitat structure, connectivity and composition/suite of species
- weed and pest animal management
- impacts on conservation values of the CRR
- offsets for residual adverse impacts on vegetation communities, flora and fauna species.

I have considered each of the submissions and how the SEIS and subsequent information received from the proponent has responded to submitter issues as part of my evaluation of the environmental impacts of the project.

5.3.2. Assessment methodology

Field surveys

Terrestrial ecology field surveys were undertaken for the EIS between June 2008 and November 2010. Aquatic field surveys were undertaken between 16-21 March 2009 and 15-22 March 2010. Field surveys were used to verify the presence of regional ecosystems[23] (REs) including those protected under the VM Act, flora and fauna species protected under the NC Act and other SSBV in the project area. The proponent considers RE type and status as a reasonable surrogate for biodiversity values and therefore can be used to determine the presence of threatened species. For example, known RE associates have been used to help determine the presence of threatened species listed under the NC Act. Details of the terrestrial ecology survey methodology are outlined in the EIS (Appendix L1).

In response to DEHP and SEWPaC comments on the EIS, the proponent conducted an additional terrestrial ecology field survey in August 2012. The survey aimed to: address a shortfall in survey effort across the off-lease portion of the project area; provide greater certainty in relation to the presence of protected species and ecological communities; and comply with relevant survey guidelines for reptiles, birds and mammals. The additional survey included:

- access road and rail spur ecological surveys (off-lease)

[22] State Significant Biodiversity Values means the values identified in Appendix A State Significant Biodiversity Values of the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011).
[23] Regional Ecosystems (REs) are a way of describing different vegetation types that relate vegetation, landform and geology

- targeted surveys for the black-throated finch (*Poephila cincta cincta*)
- targeted surveys for the red goshawk (*Erythrotriorchis radiatus*) combined with general bird surveys
- active searches for reptiles, including the retro slider (Allan's lerista) (*Lerista allanae*)
- habitat assessment (microhabitat features), ground truthing and validation of fauna habitat modelling and validation of absence of habitat for species not expected to occur.

A total of 63 days of additional field survey was completed, and complementary survey methodologies were adopted where possible to maximise the overall survey effort. The methodology and results of the additional field survey, and conclusions regarding the combined survey effort (2008–2010 and 2012 surveys), are presented in section 5 of SEIS Appendix Q. The location of August 2012 survey sites, vehicle transects and water points used for the black-throated finch survey, are presented in Figure 5.1 of SEIS Appendix Q.

Likelihood of occurrence – protected flora and fauna

Based on a desktop assessment and combined field surveys of the project site, Attachment A of the Biodiversity Offset Strategy (SEIS Appendix P) presents a likelihood of occurrence assessment for all state protected flora and fauna species that may potentially occur on the project site.

The assessment considered known RE associations for each species, known records and distribution ranges, and microhabitat requirements such as distance to a permanent water source, patch size and soil types. The likelihood of occurrence assessment was separated into four categories:

(1) *known to occur*—includes those species or communities which have been recorded on site

(2) *likely to occur*—includes species or communities previously recorded in proximity to the project area, and which have suitable habitat features available on site that may support that species or community

(3) *potentially occurring*—includes those species where suitable habitats or RE associations are present, but where there are no known records in the area

(4) *unlikely to occur*—includes those species for which the site offers limited or no potential habitat, is outside their known range and/or is without broader habitat requirements.

A list of species falling within each of these four categories and justification for inclusion is provided in Attachment A of SEIS Appendix P. Species and ecological communities identified as 'potentially occurring' or 'unlikely to occur' have not been considered in the proponent's assessment of potential impacts.

Although the black-throated finch (listed as endangered under the NC Act and EPBC Act) falls within the 'potentially occurring' category, as a precautionary measure this species was included in the proponent's assessment of potential impacts due to high-value habitat for the species being identified on the project site (refer to Attachment 2 of SEIS Appendix Q for more information).

The proponent considers that the level of combined field survey conducted across the entire project area is sufficient to support the decisions relating to the likelihood of occurrence assessment for each species or ecological community.

Habitat modelling

Detailed habitat modelling was undertaken for those species assessed as being 'known to occur' or 'likely to occur' to determine the extent of potential impacts resulting from the project. With the exception of the black-throated finch, the model used for all species was based on:

- ground-truthed RE mapping for the site
- known records on site from previous surveys
- species-specific habitat criteria based on DEHP essential habitat factors, and where these were not available, broad habitat preferences (for example, RE associations, altitude and proximity to watercourses)
- DEHP Biodiversity Planning Assessments[24] (BPA) Criteria F (Ecosystem Diversity)[25] and G (Context and Connection)[26] for the Brigalow Belt and Desert Uplands bioregions.

BPA Criteria F and G were used to support the identification of high quality habitats and maintain consistency with the habitat mapping methodology applied for the adjacent Alpha Coal project MLA.

These mapping criteria are addressed fully in SEIS Appendix P (Biodiversity Offsets Strategy). A more refined methodology was adopted for the black-throated finch to include more detail on the available habitats obtained during the August 2012 field survey, including verification of the permanency of water resources, remnant vegetation and microhabitat values (refer to section 6.5.3 of SEIS Appendix Q).

Areas of potential impact resulting from the project (including direct and subsidence impacts) were overlain with modelled high-value habitat to determine the extent of impact upon the habitat of each species (refer to the figures presented in Attachment D of SEIS Appendix P).

Coordinator-General's conclusions

Based on the proponent's comprehensive survey effort, likelihood of occurrence assessment, detailed high-value potential habitat modelling and mapping of impact areas, I am satisfied that the proponent's assessment methodology adequately allows for the identification and assessment of potential impacts of the project on SSBV, including REs protected under the VM Act and flora and fauna species protected under the NC Act.

5.3.3. Key project impacts

The project comprises various components and operational activities including open cut pits, underground mining and haul roads as described in section 2.2.2 of this report. Each of these components has the potential to cause a range of direct and indirect impacts on

[24] See www.ehp.qld.gov.au/ecosystems/biodiversity/biodiversity_assessment_and_mapping_methodology_bamm.html
[25] BPA Criteria F reflects the degree to which REs are 'packed' within an area. Values are determined according to the number of different ecosystems (richness) and the relative abundance of ecosystems (evenness). A value is determined for each remnant unit (Simpson's Diversity Index) incorporating the number of REs within a remnant and the area of each. This is compared to the maximum index value determined for that bioregion, to determine relative diversity. A high score indicates an area with a high number of REs and ecotones.
[26] BPA Criteria G relates to the extent that a remnant relates or connects to other ecological features in the locality. The proximity to endangered REs and to waterways or wetlands is used to establish the importance of a site for providing buffers to these features and links between features. Connectivity is indicative of the biodiversity and resilience that may be demonstrated by a remnant as well as opportunities it may provide for fauna movement.

biodiversity. This section provides a general discussion on the following key biodiversity impacts:

- land clearance and habitat loss
- subsidence and related impacts
- impacts on ecological communities dependant on groundwater
- impacts on surface water
- loss of connectivity
- weeds and pests
- impacts on the CRR

A discussion of impacts on protected species and REs are presented in section 5.3.4 of this chapter. Refer to section 5.1.5 of this report for my evaluation of mine dewatering on ecological communities dependant on groundwater.

Land clearance and habitat loss

A total of 3839 ha of SSBV vegetation (a combination of a number of state biodiversity values including watercourse vegetation, of concern REs and fauna habitat) would be cleared across the project area. This excludes the 632 ha of potential impacts on SSBV vegetation resulting from underground mining activities (i.e. predicted subsidence impacts).

Vegetation clearing would predominantly occur during the first five years of the project as part of site establishment and open cut operations.

Measures to mitigate impacts of vegetation clearance are contained within the draft EMPs (one for the mine tenement and one for the off-lease components) prepared for the project. Measures include (but are not limited to):

- implementing appropriate erosion and sediment controls to prevent sediment deposition in remaining habitat and to maintain the integrity of retained vegetation
- maintaining watercourse buffers based on the widths prescribed in vegetation clearing codes for the Desert Uplands (southern) bioregion[27]
- managing pests and weeds in accordance with the site-specific Pest and Weed Management Plan (SEIS Appendix T4.02)
- undertaking rehabilitation in accordance with the completion criteria identified in the RMP.

The RMP aims to return a stable landform capable of uses similar to those prior to disturbance (a mix of bushland and low density cattle grazing land). The proposed final land forms and land use aim to link remnant vegetation where possible and return some conservation values. Offsets are proposed for the unavoidable direct clearing of remnant vegetation where it contains SSBV (refer to section 5.3.5 of this report and the Kevin's Corner Biodiversity Offset Plan).

In response to DEHP and SEWPaC comments on the EIS and SEIS, the proponent has updated its RMP (May, 2013) to include more detailed, measurable and achievable rehabilitation completion criteria. I have stated conditions as part of the draft EA for the

[27] http://www.nrm.qld.gov.au/vegetation/pdf/codes/sdu_ongoingcode_250604.pdf

project to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in the RMP, May 2013) and rehabilitation must commence progressively as areas become available. Annual reviews of monitoring data must be conducted to assess trends and monitor program effectiveness.

The proponent has also updated its EMPs to ensure both documents contain a consolidated list of mitigation measures identified elsewhere in the EIS and SEIS documentation. The proponent must implement the EMPs for the project in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

Coordinator-General's conclusion

Based on the mitigation measures provided in the proponent's RMP (May 2013), and the comprehensive requirements of the draft EA conditions, I am satisfied that the proponent would minimise impacts on protected terrestrial ecology associated with land clearance. I note that provisions to offset likely adverse residual impacts on SSBV are outlined in the Kevin's Corner Biodiversity Offset Plan.

Subsidence and related impacts

The ISMP (SEIS, Appendix N) presents the results of detailed subsidence modelling and identifies areas of high-value potential habitat at risk of impact from cracking, ponding and mitigation works (including ripping cracks, pillar excavation and timber groyne construction). This modelling is considered a worst-case assessment as it is based on an overburden composed wholly of rock and does not take into account the quaternary sediments which overlay much of the project area (i.e, clay rich with an average thickness of 40 m).

Mapping presented in the Biodiversity Offset Plan identifies where impacts on potential SSBV habitat may occur from subsidence (refer to Figure 3.2 of the Kevin's Corner Biodiversity Offset Plan). Section 3.2 of the Biodiversity Offset Plan (May 2013) provides a detailed discussion on the impacts to potential SSBV habitat resulting from subsidence-related ponding, cracking and other mitigation measures. A total of 632 ha of high-value SSBV habitat is predicted to be impacted from subsidence and related impacts. The impacts of subsidence on individual species and ecological communities is discussed in section 5.3.4 of this chapter.

Mitigation measures focus on minimising the effects of cracking and ponding on watercourses (refer SEIS Appendix N, section 12). Areas of predicted permanent ponding (considered to be ponds of greater than 1.2 metres that would require more than 6 months to evaporate) would be drained by excavating the pillar structure to allow natural water stream flow. Other mitigation measures include crack infilling, installing erosion control devices, and retaining riparian vegetation to maintain watercourse stability.

All modelled subsidence-related impacts (ponding, cracking and subsidence mitigation works) are proposed to be offset prior to the commencement of mining operations. Accordingly, the project would have offsets in place significantly in advance of the predicted impacts, given some of the underground mine areas would not be developed for 20–30 years.

The management and monitoring of impacts from subsidence would be a long-term proposition, as the impacts of subsidence may not be evident for several years (due to time-lag effects and climatic/seasonal variables) and the proposed 30-year duration of underground mining. Accordingly, I consider that mitigation and restoration activities would need to be adaptive processes as the actual impacts may vary from the predicted impacts and the level of success of mitigation measures must also be taken into account.

The ISMP (SEIS Appendix N, section 12) describes an ongoing adaptive management program of monitoring subsidence impacts and the effectiveness of mitigation measures over the life of the project.

Monitoring would include the establishment of reference sites (not impacted by subsidence and likely to be off-site) matching the REs potentially impacted by subsidence. In order to provide a cross-representation of REs that may be disturbed, permanent monitoring sites would also be established prior to the commencement of underground mining, some of which would be located off site within the CRR and Cudmore National Park (CNP). This would involve bio-condition assessment, photo monitoring and observations of other criteria such as foliar discoloration, increased pathogenic attack, tree death and climatic factors.

As outlined in the ISMP, the proponent would document actual impacts and validate predicted subsidence-related impacts from the modelling in five year stages. Monitoring results would be reported at the end of each five-year period with any proposed changes to management measures.

I have stated conditions for the project's draft EA (Appendix 1, Schedule F) in order to mandate the proponent's proposed management and monitoring program of subsidence impacts. This includes five-yearly reporting that must:

- assess the area of biodiversity values predicted to be impacted by the underground mining activities for the next five years
- identify the actual areas of biodiversity values impacted by the underground mining activities (based on monitoring results).

Based on the results of monitoring, where the actual area of disturbance is identified as greater than the modelled area of disturbance, I have conditioned (as part of the draft EA) that supplementary biodiversity offsets must be provided (Appendix 1, Schedule F).

Coordinator-General's conclusion

Taking account of the modelled subsidence predictions and mitigation measures provided in the proponent's ISMP, commitments in the draft mine EMP and the comprehensive requirements of the draft EA conditions, I am satisfied that the proponent would minimise impacts on biodiversity associated with subsidence and related impacts. I note that provisions to offset likely adverse residual impacts on SSBV are outlined in the Kevin's Corner Biodiversity Offset Plan.

Impacts on surface water

Key surface water impacts resulting from the project which could potentially impact terrestrial ecology include:

- changes to floodplain inundation and frequency from the project's site water management strategy (flood levee banks and creek diversion—refer to Figure 7-1, SEIS Appendix K), which could alter vegetation community composition and potentially reduce available habitat within the project area
- diminished water quality through, for example, an increase in sediment and erosion or the uncontrolled release of contaminated water. Reduced water quality can impact aquatic fauna and indirectly impact SSBV by reducing food sources.

Flooding

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure; hydraulic modelling (SEIS Appendix K: Revised Surface Water Hydraulics Report) predicted that despite an increase in flood levels of up to 1.1 metres during a 1:1000 Annual Exceedance Probability (AEP) flood event, no significant changes to the area of flooding or duration would occur from the construction and operation of the project. This is due to the restriction of the area of flood waters between levees, which would traverse the left bank of Sandy Creek, and the relatively steep natural topography on the right bank of the channel that spans the area of increased water level.

Areas of prolonged inundation (i.e. surface water ponding) are predicted in association with subsidence from proposed underground mining. These impacts, as well as other subsidence-related impacts, have been considered separately under section 5.3.4 of this chapter.

The Kevin's Corner project and adjacent Alpha Coal project involve a number of creek diversions and flood levees which may result in cumulative flooding impacts. The cumulative impact assessment of both projects (SEIS, Appendix S) determined that flood levels within the Kevin's Corner mining lease may increase by an additional 90 mm (in addition to the 1.1m increase for the Kevin's Corner project) under a 1:1000 AEP event and result in an equivalent afflux at the upstream (Alpha Coal project) lease boundary. However, flood protection for the Kevin's Corner project has been designed with a one-metre freeboard above the predicted 1:1000 AEP flood level (of 1.1m). This is considered adequate to prevent inundation of the project site, including completed longwall panels, from a cumulative increase in water levels.

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, a comparison of the cumulative flood extent with the modelled baseline scenario (refer to Figure 5.4) shows no significant change in the area of flooding or duration. Modelling has shown that with both the Alpha and Kevin's Corner projects in place, there would be a minor reduction (69 ha) in the area flooded for greater than 96 hours compared to the baseline scenario. The reduction in flooding is minor in scale and applies only to major flood events. Therefore, it is not considered likely to have a detrimental effect on SSBV species or habitats.

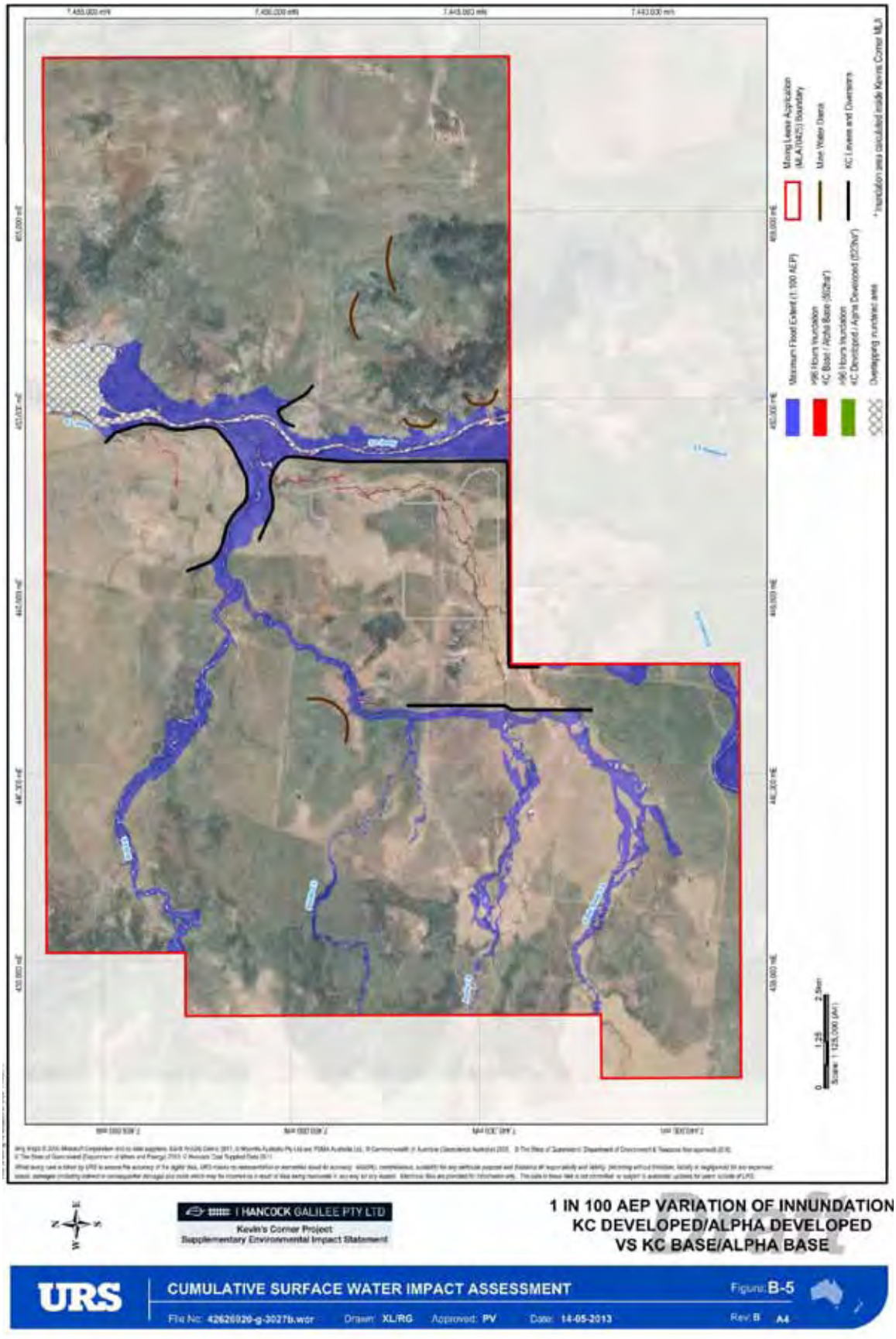


Figure 5.4 Comparison of cumulative flood extent with the modelled baseline scenario

Surface water quality

The quality of water released off-site is dependent on: the management of land disturbance during construction; the design, construction and rehabilitation of stream diversions to ensure minimal stream channel erosion and destabilisation; and the management of contaminated water to ensure no uncontrolled or non-compliant releases (e.g. through the design of regulated structures associated with the project's mine water management system). Release of water from the site would be controlled by conditions attached to the project's EA in accordance with the mitigation measures proposed in the mine EMP. Key mitigation measures to reduce impacts on surface waters, as identified in the mine EMP, include:

- adopting best practice erosion and sedimentation controls and pollution control measures across the project area
- designing on-site water storages to have sufficient capacity so that controlled releases (in accordance with draft EA requirements) to the receiving environment would be minimal
- implementing an appropriate mine water management system that would contain mine affected water on site for re-use during coal processing
- retaining riparian vegetation to maintain watercourse stability
- re-profiling drainage paths to stabilise banks and using contour banks, rock armouring, etc. to manage concentrated flows and reduce sediment load increases
- implementing a surface water quality monitoring program in order to assess the impact of the project operations on the receiving environment.

DNRM advises that at this stage of the approval process the proponent's assessment documentation sufficiently addresses the impact of stream diversions and regulated structures required for the Kevin's Corner and Alpha Coal projects on local hydrology and geomorphology. Further information on the detailed design of watercourse diversions and resultant impacts would be provided for both projects as part of future applications for licences required under the *Water Act 2000*.

In particular, the design of any diversion would need to be to acceptable engineering standards and in accordance with the DNRM regional guideline entitled *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry* version 5 (2011).[28] This requires that watercourse diversions replicate geomorphic and riparian vegetation conditions of existing watercourses.

Coordinator-General's conclusion

Based on the proponent's cumulative flood modelling, mitigation measures provided in the proponent's EMPs, comprehensive requirements of the draft EA conditions and advice received from DNRM, I am satisfied that the proponent would minimise impacts on biodiversity associated with potential impacts on surface water resources. I note that provisions to offset likely adverse residual impacts on SSBV are outlined in the Kevin's Corner Biodiversity Offset Plan. Impacts resulting from subsidence and associated impacts, including surface water ponding, are considered under the 'Subsidence and related impacts' section of this chapter.

[28] Department of Natural Resources and Mines, *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*, Department of Natural Resources and Mines, 2011.

I have stated a number of draft EA conditions in order to protect surface water values. This includes conditions relating to the detailed design and hydraulic performance requirements to ensure regulated structures (i.e. dams, levees and diversions) can accommodate extreme events (Appendix 1, Schedule G) and requirements to address surface water quality discharge, including during extreme weather events (Appendix 1, Schedule C).

In order to address potential cumulative impacts on regional water resources, including potential impacts on aquatic habitat and ecological systems, I have also made recommendations to relevant State government departments for the collation of monitoring data and the risk-based assessment of regional cumulative impacts from proposed mining project activities (Appendix 4). Refer to Appendix 5: Response to IESC advice, for more information regarding potential impacts of the project on surface water resources.

Loss of connectivity

Connectivity across the project area has been considered in terms of local habitat connections and broader corridors that sit in a regional context. Within the site, connectivity is linked to riparian corridors of vegetation which run from west to east across the site to connect with the north–south running Lagoon Creek/Sandy Creek riparian corridors. Key areas of connectivity within the project area and identified terrestrial and riparian corridors adjacent to the project are shown in Figure 7.4 of SEIS Appendix Q.

On the whole, the SEIS considers that connectivity through the project site would be maintained. Watercourses would continue to flow through the site and the majority of riparian vegetation would be maintained. The proposed diversion of Little Sandy Creek would not have a significant impact on local connectivity as this area has been identified as providing minimal habitat value for any identified protected species or ecological communities. Some sections of impacted riparian vegetation (e.g. from land clearance and subsidence-related impacts) would result in impacts on connectivity. However, by implementing mitigation and revegetation measures, the proponent considers that the majority of these impacts would be short-term.

On a local scale, connectivity would potentially be disturbed by two watercourse crossings to be constructed on Lagoon Creek (west of the stockpile) and on Well Creek (between the northern pit and the CHPP). Riparian vegetation along these watercourses contain habitat for a number of protected species which may be impacted to varying degrees, depending on mobility and specific habitat requirements. Section 5.3.4 of this report considers areas of potential habitat fragmentation and impacts on connectivity for individual protected species.

Mitigation measures to maintain connectivity, as identified in the mine EMP and RMP (May 2013), include:

- reinstatement and enhancement of disturbed areas in accordance with the final landform proposals to maintain linkages between critical areas of habitat
- rehabilitation of the project area to a mix of bushland and low-density cattle grazing land that would reinstate links between undisturbed areas of remnant native vegetation
- rehabilitation of disturbed areas and the provision of buffers around undisturbed areas of remnant vegetation to minimise habitat fragmentation and edge effects
- a particular focus on riparian vegetation retention and restoration to support a significant proportion of the fauna species habitats and movement corridors through the site

- clearing of riparian vegetation necessary for the project to proceed in a staged manner to allow fauna to migrate to adjacent habitats.

Coordinator-General's conclusion

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have also stated a number of draft EA conditions to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in the RMP, May 2013) and rehabilitation must commence progressively as areas become available. Annual reviews must be conducted of monitoring data to assess trends and monitor the rehabilitation program effectiveness.

Based on the mitigation measures provided in the proponent's RMP, commitments made in the EMPs for the project and the comprehensive requirements of the EA conditions, I am satisfied that the proponent would minimise impacts on biodiversity associated with loss of connectivity. I note that provisions to offset likely adverse residual impacts on SSBV, including riparian watercourse vegetation, are outlined in the Kevin's Corner Biodiversity Offset Plan.

Weeds and pests

Three weed species declared as Class 2 weeds under the *Land Protection (Pest and Stock Route) Management Act 2002* (LP Act) were identified during field surveys; the common pest pear (*Opuntia stricta*), the velvety tree pear (*Opuntia tomentose*) and the parkinsonia (*Parkinsonia aculeate*).

Eight introduced pest fauna species were also identified including the cane toad (*Rhinella marina*), house mouse (*Mus musculus*), feral cat (*Felis catus*), feral pig (*Sus scrofa*), European rabbit (*Oryctolagus*), feral goat (*Capra hircus*) and dingo/wild dog (*Canis familiaris dingo*). These species are declared as Class 2 pests under the LP Act with the exception of the cane toad and house mouse (these species are not declared under Queensland legislation).

For further details on weed and pest animal species recorded in surveys, refer to the EIS Appendix L1.

Potential impacts and mitigation measures

The impacts of these weed and pest species could include the following:

- predation on native species
- competition for food resources, which may decrease abundance of prey for native predator species
- habitat changed due to destruction of plants; changed floristic composition; reduced generation of plants; alteration of soil structure; increased invasion and spread of weeds
- increased access for non-native predator species
- toxicity to native species

- reduced water quality and availability
- spread of exotic invertebrates and creation of habitat suitable disease, including the spread of root-rot fungus *Phytophthora cinnamomi*.

Weeds and pests would be managed through the implementation of a Pest and Weed Management Plan (SEIS, Volume 2, Appendix T4.02). Key mitigation measures include:

- controlling identified weeds of management concern, including declared and environmental weeds, in accordance with local best management practice from the Jericho Shire Pest Management Plan and/or the state government pest fact sheet
- implementing a weed spraying program and developing vehicle washdown facilities
- promoting the awareness of weed management issues in the Site Induction Program for the project
- effectively managing wastes on site – including the proposed landfill (SEIS Appendix T4.06, Landfill Design and Environmental Management Plan)
- implementing measures to control feral cats, including trapping, fencing and possibly poisoning treatments by licensed operators, in combination with current land management practices
- implementing measures to control feral pigs, including a combination of physical controls, trapping and/or barrier construction, and possible poisoning treatments by licensed operators
- implementing measures to control rabbits, by destroying rabbit warrens (via ripping, ploughing, blasting, and fumigating) and possible poisoning treatments by licensed operators
- implementing measures to control feral goats using mustering, fencing and trapping in conjunction with ongoing land management practices.

Coordinator-General's conclusion

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

Based on the mitigation measures provided in the project's EMPs, including the Pest and Weed Management Plan, I am satisfied that the project would effectively manage weeds and pests in order to minimise impacts on native flora and fauna species on the project site.

Impacts on Cudmore Resources Reserve

The CRR, listed under Schedule 4 Resources Reserves of the Nature Conservation (Protected Areas) Regulation 1994, extends over 1,673.5 ha of the north-western corner of the proposed mining lease and overlaps with the northern underground mine. The CRR is under the joint trusteeship of the DNRM and the Department of National Parks, Recreation, Sport and Racing (DNPRSR). In accordance with the NC Act, the proponent must seek from DNPRSR and DNRM approval for an 'Authority to undermine a Protected Area'. Refer to section 5.11 of this report for more information on the CRR.

The key potential impact on the conservation values of CRR is from impacts associated with subsidence. The ISMP (SEIS Appendix N) predicts low potential for subsidence impacts to

occur within the CRR. Due to the depth of cover (approximately 290 m), underground mining is predicted to result in only minor cracking in this area of the mine lease, with crack widths potentially ranging from 4 mm to 40 mm (refer to Figure 10-2 of the ISMP). The ISMP considers that crack widths of 100 mm or greater has the potential to cause root shear and consequent vegetation losses. Accordingly, this level of predicted cracking is not predicted to result in impacts on vegetation.

The ISMP identified one area (1.1 ha in size) within this part of the mine lease where water may pond following subsidence (identified as 'pond 108' in Table 9-2 of the ISMP). An assessment of likely sediment accumulation within the predicted ponding areas (section 9.3.4 of ISMP) shows that this area is expected to infill rapidly (within approximately 0.2 years). Subsidence within this area is not predicted to give rise to increased erosion (SEIS Appendix N, Figure 7-1).

Given the low potential for subsidence impacts to occur within the CRR, the proponent considers it unlikely that mitigation measures would be required. However, if mitigation is required, primarily for crack remediation, low impact crack remediation measures would be implemented (refer to the 'subsidence and related impacts' section of this chapter for more information).

Section 12 of the ISMP describes an ongoing adaptive management program of monitoring subsidence impacts and the effectiveness of mitigation measures over the life of the project. Monitoring would include the establishment of reference sites (not impacted by subsidence) matching the REs potentially impacted by subsidence, some of which would be located within the CRR (off lease section) and CNP.

In accordance with the requirements of the NC Act, prior to the commencement of any mining activities occurring within or beneath the CRR, the proponent would need to develop an agreed CRR Operations Plan (in consultation with joint trustees DNPRSR and DNRM) to deal specifically with those activities proposed to occur within and beneath the CRR. Refer to SEIS Appendix T3 for more information on the structure and proposed table of contents. In particular, the plan would detail management of operations within the CRR to minimise impacts from surface cracking, erosion, sedimentation and ponding on aquatic ecology.

The proponent has also made a number of commitments to ensure the appropriate management of potential impacts on the CRR (Commitments 30.1 – 30.15, Appendix 7 of this report), including consultation with DNPRSR regarding appropriate subsidence management measures (monitoring and, if required, mitigation) to be implemented within the CRR.

In addition to the 1.1 ha of remnant vegetation predicted to be impacted by subsidence-related ponding, to ensure the maintenance of stream flows in the area an additional 2 ha of remnant vegetation would need to be cleared as a result of mitigation works in watercourse vegetation. The proponent advises that 2.7 ha of the total impact on the CRR (3.1 ha) includes vegetation that is of SSBV and would therefore be included in the proponent's offset proposal.

Coordinator-General's conclusion

Based on the subsidence predictions provided in the proponent's ISMP and the limited direct vegetation clearing required in this part of the mining lease, I am satisfied that the project

would result in minimal impacts to CRR conservation values. I note that provisions to offset likely adverse residual impacts on SSBV are outlined in the Kevin's Corner Biodiversity Offsets Plan.

In accordance with the provisions of the NC Act, I note that the proponent must seek from DNPRSR and DNRM approval for an 'Authority to undermine a Protected Area'. This would include the development of an agreed CRR Operations Plan detailing those activities proposed to occur within or beneath the CRR, including potential subsidence impacts.

As identified in the 'subsidence and related impacts' section of this chapter, I have also stated draft EA conditions in order to mandate the proponent's proposed management and monitoring program of subsidence impacts.

5.3.4. Potential impacts to SSBV

SSBV that are considered 'known' or 'likely to occur' within the project area include:

- Protected REs listed under the VM Act as 'endangered' or 'of concern'
- Protected animals listed under the NC Act as 'endangered', 'vulnerable', 'near threatened' or 'special least concern'
- Watercourse vegetation
- Connectivity (defined in the Qld Biodiversity Offsets Strategy (2011) as those areas of SSBV that form an important link or stepping stone, or form part of a patch of vegetation cover greater than 5 ha).

No flora species protected under the NC Act are considered to occur in the project area. Similarly, no SSBV essential habitat or wetlands as defined in the Qld Biodiversity Offsets Strategy (2011) occur on the project area. Accordingly, the project is unlikely to result in any impacts on these SSBV.

Protected Regional Ecosystems

Field surveys within the off-lease rail and road corridors confirmed the occurrence of 59 ha of RE 11.8.11 (*Dichanthium sericeum* grassland on Cainozoic igneous rocks), which is listed as 'of concern' under the VM Act. The proponent has committed to offset this unavoidable impact as part of its Kevin's Corner Biodiversity Offset Plan (refer to section 5.3.5 of this chapter).

Protected animals

Table 5.1 identifies 11 protected fauna species considered known or likely to occur on the project area and the extent of the potential impacts on high quality habitat. Section 5.3.3 of this chapter outlines a number of commitments to avoid and mitigate impacts on vegetation in general that would equally apply to protected animals. In addition, the EMPs for the project identify a number of fauna-specific mitigation measures, including the following:

- The Staff Induction Program would include information on species of conservation significance including photos, descriptions and preferred habitat
- Fauna spotters would conduct surveys prior to vegetation clearance to identify fauna individuals/or nests

- In the event that protected bird species' nests or any active colonies or individuals of protected reptiles are located, translocation would be conducted by an appropriately qualified person to suitable nearby habitat
- Maintain all black-throated finch foraging habitat within 400m of nesting habitat, if detected, and within 3km of water sources, and maintain connectivity between important black-throated finch habitat, or areas known or likely to contain the species, with corridors of at least 100 m in width where possible
- Build structures (for example buildings, roads) at least 1km away from key black-throated finch water resources and nesting trees where possible
- Vehicle operators would be made aware of the presence of the squatter pigeon and koala and the potential for these species to be encountered on roads and tracks
- Rehabilitation plans would incorporate preferred koala feed tree species in areas away from major traffic routes
- Implementation of stock management procedures to ensure over grazing does not occur in known areas of high-value habitat
- Implementation of appropriate fire management procedures, light spill control measures and standard noise mitigation measures
- Avoid creating predation opportunities for birds of prey (of relevance to protected reptile species such as the Brigalow scaly-foot)
- Develop road and rail corridor management programs that protect reptile habitat features
- Investigate and implement appropriate fauna movement control devices to minimise the potential for collision
- Monitor fauna vehicle collision rates to identify high mortality areas with a view to incorporating additional protective measures where appropriate.

Table 5.1 Potential impact on high value habitat of animals protected under the *Nature Conservation Act 1992*

Protected fauna species	NC Act status	EPBC Act status	Impact – clearing of high quality habitat (ha)	Impact – subsidence of high quality habitat (ha)	Total impact on high quality habitat (ha)
Known to occur					
Squatter Pigeon (*Geophaps scripta scripta*)	Vulnerable	Vulnerable	882	276	1,158
Square-tailed kite *(Lophoictinia isura)*	Near Threatened	Not listed	918	284	1,202
Cotton pygmy-goose *(Nettapus coromandelianus*	Near Threatened	Not listed	617	147	764
Koala *(Phascolarctos cinereus)*	Special Least Concern	Vulnerable	617	147	764
Likely to occur					
Red Goshawk *(Erythrotriorchis radiatus)*	Endangered	Vulnerable	917	284	1,201
Ornamental Snake *(Denisonia maculata*)	Vulnerable	Vulnerable	602	242	844
Yakka Skink *(Egernia rugosa)*	Vulnerable	Vulnerable	1,410	5	1,415
Brigalow Scaly Foot *(Paradelma orientalis)*	Vulnerable	Vulnerable	1,410	5	1,415
Capricorn Ctenotus *(Ctenotus capricorni)*	Near Threatened	Not listed	1,410	6	1,416
Black-chinned honeyeater *(Melithreptus gularis)*	Near Threatened	Not listed	1,685	337	2,022
Black-throated Finch (southern) *(Poephila cincta cincta)**	Endangered	Endangered	730	270	1,000

* The Black-throated finch was considered to have limited potential to occur, however following discussions with SEWPaC the proponent has agreed to adopt a precautionary approach whereby potential high value nesting and foraging habitats have been mapped and are proposed to be offset.
Source: Adapted from Attachment B of SEIS Appendix P and Table 5.2 of the Biodiversity Offsets Plan (May 2013)

In accordance with the provisions of the NC Act, the proponent must also prepare and implement Species Management Plans (SMPs) for all 11 fauna species predicted to be impacted by the project. SMPs would include comprehensive mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on each species.

With the exception of the squatter pigeon, the proponent has committed to offset likely adverse residual impacts for these species, as outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013) and section 5.3.5 of this chapter.

The squatter pigeon is a highly mobile species which utilises a range of habitats and the proponent considers that the project would not have a significant impact on populations of this species in the region (refer to SEIS Appendix Q). Accordingly, the proponent has proposed no offsets for this species. However, the proponent notes that the majority of habitat for this species is provided under offsets for other species due to the fact that this species has a broad range of acceptable habitats that it can utilise. In particular, the high-value habitat for this species corresponds very closely to that identified for the red goshawk.

Watercourse vegetation

A number of watercourses with associated riparian vegetation exist within the project area. DNRM mapped stream orders range from stream order 1 to stream order 6. Table 5.2 identifies the extent of watercourse vegetation predicted to be impacted by the project through either clearing (e.g. to maintain stream flows) or subsidence (cracking, ponding or clearing from required mitigation works).

Table 5.2 Watercourse vegetation impacted by the project

Watercourse vegetation stream order	Impact - clearing and predicted subsidence (ha)
Stream order 1	126
Stream order 2	33
Stream order 3	152
Stream order 4	217
Stream order 5 or greater	61

The larger stream orders occur on the proposed mine lease within the Desert Uplands bioregion. All watercourse vegetation has been mapped as 'least concern' under the VM Act. Section 5.3.3 of this chapter outlines measures in order to mitigate impacts on watercourse/riparian vegetation. Proponent proposals to offset likely residual impacts are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013) and section 5.3.5 of this chapter.

Connectivity

The proponent considers that 'of concern' RE 11.8.11 predicted to be impacted from the construction of the proposed off lease rail spur and access road (59 ha) would not experience impacts on connectivity. This is because the clearing width would be limited to 60 m (as outlined in the Kevin's Corner Biodiversity Offsets Plan) and there would be areas of the RE remaining either side of the linear infrastructure that would be large enough to be viable.

Riparian vegetation along watercourses is considered to be of connectivity value for fauna species across the project area. The Mine EMP for the project outlines measures to avoid, mitigate and rehabilitate impacts on watercourse vegetation to ensure connectivity and habitat is maintained. The estimated residual impacts on watercourse vegetation have been quantified and are proposed to be offset (refer to the Kevin's Corner Biodiversity Offset Plan (May 2013) and section 5.3.5 of this chapter). The proponent considers that no residual impact on connectivity of SSBV within the project area is expected to occur as a result of the project.

Coordinator-General's conclusions

I have reviewed the EIS and associated documentation, including the Biodiversity Offset Strategy (SEIS Appendix P) and Kevin's Corner Biodiversity Offset Plan and conclude that the proponent has adequately assessed the impacts of the project on SSBV. I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general, that would equally apply to protected fauna species. The EMPs for the project also contain a number of specific measures to mitigate impacts on protected animals. The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the provisions of the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have also made a recommendation (Appendix 4, Recommendation 6) regarding information that should be included in the SMPs required for fauna species predicted to be impacted by the project.

However, given the scale of the proposed mining operation there would be residual adverse impacts. Proponent proposals to offset these impacts are discussed in section 5.3.5 below.

5.3.5. Offsets

In May 2013, the proponent finalised the Kevin's Corner Biodiversity Offsets Plan. The Offsets Plan aims to address both State and Australian Government offset requirements based on policies in at that time. The Offsets Plan responds to comments received on the Biodiversity Offsets Strategy prepared as part of the SEIS (Appendix P), including: an updated offset assessment under the new EPBC Act *Environmental Offset Policy* (October 2012) and accompanying *Offsets Assessment Guide*; and inclusion of information on potential offset sites in accordance with the Queensland Government's Galilee Basin Offset Strategy (GBOS).

The proponent is proposing to offset up-front all predicted residual direct (vegetation clearing associated with project infrastructure) and indirect (residual impacts as a result of underground mining and subsidence) impacts on SSBV for the life of the project. This would ensure that the proponent is always in credit as suitable offset sites would be in place within a short period of time post project commencement, even though a proportion of impacts would not be experienced until at least 15–20 years later.

The extent of SSBV impact areas required to be offset for the life of the project in accordance with Queensland Biodiversity Offset Policy (2011) requirements is identified in Table 5.3. As many of the species utilise similar habitat features, there are overlaps between each of the impact areas and predicted impacts should therefore not be totalled.

It should be noted that offsets required for six protected animals under the NC Act are also protected under the EPBC Act. Accordingly, these species would also be covered by MNES offset requirements under the EPBC Act. SEWPaC requires that the proposed offset areas for MNES are included in the plan and inserted in the balance sheet in the *EPBC Act Offsets Assessment Guide* to ensure the overall conservation outcome improves or maintains the viability of the MNES. The offset areas have not yet been completed for SSBV as the State process requires this after Ecological Equivalence (EE) assessments have been completed to ensure the impact and offset sites are ecologically equivalent.

The Kevin's Corner Biodiversity Offset Plan notes that EE assessments would be undertaken at the impact site in accordance with State guidelines and the proponent would submit an updated Offsets Plan to DEHP prior to the commencement of mining activities.

The Kevin's Corner Biodiversity Offsets Plan provides a tailored assessment for each of the six protected animals protected under both the NC Act and EPBC Act proposed to be offset, and an assessment of a proposed offset site for its suitability for that particular species. Habitats were determined through desktop modelling based on RE associations and habitat features for each species that are consistent with the habitat modelling prepared for the impact sites.

The total offset area to meet the Commonwealth requirements equates to 5,300 ha and has been strategically positioned in the areas identified as 'conservation hubs' in the GBOS. Due to the high mining interest in the Galilee Basin, DEHP have pre-emptively developed the GBOS to identify areas with high conservational value which can provide the best biodiversity benefits in the region. Offset areas for SSBV are expected to coincide with these areas identified for MNES, however this would be confirmed in the EE assessments.

As specified in the Kevin's Corner Biodiversity Offset Plan, the proponent would engage with landholders in order to undertake ground-truthing of potential offset sites to ensure a no net loss in biodiversity values. After the EE assessments for both the impact and potential offset sites have been completed, these would be provided to DEHP for approval. This information would also be used to update the balance sheet in the *EPBC Act Offsets Assessment Guide* and submitted to SEWPaC.

The proponent would then provide a Biodiversity Offset Delivery Agreement to DEHP and SEWPaC outlining offset requirements, final offset sites, ground-truthing results, updated EE Assessments and balance sheet. The proponent would legally secure the offset sites within six months of the agreement being endorsed by the agencies and an Offset Area Management Plan would be developed for each site. These plans would outline measures to enhance habitat values and reduce threats as well as provide restoration requirements and specifications for monitoring and compliance.

Table 5.3 SSBV offset requirements under the Queensland Biodiversity Offset Policy (2011)

SSBV	NC Act status	VM Act status	EPBC Act Status	Impact area to be offset (ha)
Black-throated Finch (southern) *(Poephila cincta cincta)**	Endangered	-	Endangered	1000
Koala *(Phascolarctos cinereus)**	Special Least Concern	-	Vulnerable	764
Red Goshawk *(Erythrotriorchis radiatus)**	Endangered	-	Vulnerable	1201
Ornamental Snake *(Denisonia maculata)**	Vulnerable	-	Vulnerable	844
Brigalow Scaly Foot *(Paradelma orientalis)*	Vulnerable	-	Vulnerable	1415
Yakka Skink *(Egernia rugosa)**	Vulnerable		Vulnerable	1415
Black-chinned honeyeater *(Melithreptus gularis)*	Near Threatened	-	-	2022
Capricorn's Ctenotus *(Ctenotus capricorni)*	Near Threatened	-	-	1416
Square-tailed kite *(Lophoictinia isura)*	Near Threatened	-	-	1202
Cotton pygmy-goose *(Nettapus coromandelianus*	Near Threatened	-	-	764
Dichanthium sericeum grassland on Cainozoic igneous rocks (RE 11.8.11)	-	Of concern	Endangered	59
Watercourse Vegetation	Stream Order 1	Least concern	-	126
Watercourse Vegetation	Stream Order 2	Least concern	-	33
Watercourse Vegetation	Stream Order 3	Least concern	-	152
Watercourse Vegetation	Stream Order 4	Least concern	-	217
Watercourse Vegetation	Stream Order 5+	Least concern	-	61
Squatter Pigeon (*Geophaps scripta scripta*)	Vulnerable	-	Vulnerable	Not applicable – majority of impact area provided under offsets for other species

* Protected animals also protected under the EPBC Act. Accordingly, these species would also be covered by MNES offset requirements under the EPBC Act
Source: Adapted from Table 5.2 of the Biodiversity Offsets Plan (May 2013)

5.3.6. Coordinator-General's overall conclusions - SSBV

I have reviewed the EIS and associated documentation and conclude that the proponent has adequately assessed the impacts of the project on SSBV, including REs protected under the VM Act and flora and fauna species protected under the NC Act. I am satisfied that the proponent has used the 'avoid, mitigate, offset' hierarchy of principles to guide its assessment and ensure the project would not result in unacceptable impacts on SSBV.

I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation and, in particular, impacts on the high quality habitat of protected animals. The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off lease road and rail spur components).

I note that in accordance with the NC Act, the proponent would also prepare and implement SMPs for all protected animals likely to be impacted by the project. I have also made a recommendation (Appendix 4, Recommendation 6) regarding the scope of information to be provided in these plans.

I have stated a number of draft EA conditions to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in Appendix 1, Attachment A) and rehabilitation must commence progressively as areas become available (refer to section 5.11 of this report for more information).

In order to address potential cumulative impacts on regional water resources, including but not limited to potential impacts on ecological systems, I have also made a recommendation to relevant State government departments for the collation of monitoring data and the risk-based assessment of regional cumulative impacts from proposed mining activities (Appendix 4, Recommendation 9).

5.4. Waste

5.4.1. Introduction

This section of the report evaluates potential impacts and mitigation measures associated with the management of both general waste and mining waste of the project. Mining wastes are the materials disturbed during mining (overburden and interburden) and coal processing (coarse rejects and fine rejects), which do not have marketable value and are disposed of on the mining lease. General waste encompasses the remainder of waste produced by the project.

Submissions on the EIS and SEIS raised a number of issues in relation to waste, including:

- general waste management, including predicted volumes and disposal
- availability of adequate waste services and infrastructure capacity in the region to accommodate the types and volumes of waste generated from the project during the initial construction period
- mining waste management, including tailings waste management and the impact on groundwater quality
- flood protection.

My evaluation of the flood protection of project infrastructure, and the quality of surface water and groundwater resources, as raised in submissions, is discussed in sections 5.2 and 5.1 of this report.

I have considered each of the submissions and how the SEIS and subsequent information received from the proponent has responded to submitter issues as part of my evaluation of the environmental impacts of the project.

5.4.2. General waste

Potential impacts and mitigation

A range of general wastes would be generated from construction and operation of the project, including vegetation clearing, demolition, blasting, excavation, assembly and maintenance of machinery, general office operations and staff activities. The main waste management strategies that would be adopted for the project include waste minimisation (including waste segregation for re-use or recycling), cleaner production and appropriate waste disposal. Table 5.4 identifies the estimated general waste types and quantities to be generated for the project and specific measures (as identified in the Mine EMP) to ensure effective management of general wastes, thereby avoiding impacts on the environment (e.g. waterways) and health and safety.

Table 5.4 Estimated general waste generation and management measures

General waste type and quantity	Waste management measures
Green waste—vegetation clearing Construction: 390 000 t Operations: 42 750 t	Suitable material would be used on site to provide fauna habitat. Remaining material would be chipped and mulched for re-use during progressive rehabilitation and revegetation. Burning of green wastes would only occur as a last resort, subject to obtaining necessary permits and approvals.
Concrete, bricks and bitumen Construction: 3000 t	Concrete and brick would be stockpiled in designated storage areas for re-use (e.g. crushed for road base) or alternatively disposed on site. Contaminated material would be disposed to an off site regulated waste landfill by a licensed contractor.
Processed wood products Construction: 3000 t Operations: 1 t	Stockpiled in designated storage area for re-use on site or alternatively removed by licensed contractor for re-use, reprocessing or final disposal. Where possible, pallets would be returned to the supplier.
Electrical wastes Construction: 1000 t Operations: 1 t	Stockpiled in designated storage area to be removed by licensed contractor for re-use, reprocessing or final disposal at a licensed facility.
Sealers, resins, solvents and paints Construction: 2 t Operations: 1 t	Stockpiled in designated storage area to be removed by licensed contractor for re-use, reprocessing or final disposal at a licensed facility.
Metals Construction: 900 t Operations: 2000 t	Metals would be source-separated for removal by a licensed operator for recycling. Residual (non-recyclable or contaminated) material would be disposed of to landfill—initially at either Alpha or Emerald until the on-site engineered landfill is operational.
Plastic, glass, paper and cardboard Construction: 3560 t Operations: 300 t	Where feasible, plastic and glass would be segregated to facilitate re-use on site or recycling off-site. All wastes would be source-separated for removal by a licensed operator for recycling. Residual (non-recyclable) material would be disposed of to landfill—initially at either Alpha or Emerald until the on-site engineered landfill is operational.
Putrescible waste Construction: 18 000 t Operations: 5 000 t	General refuse would be collected in covered bins and removed regularly (at least once per week) for recycling off site or final disposal—initially to landfill at either Alpha or Emerald until the on-site engineered landfill is operational. General refuse bins would be located with recycling bins to promote segregation of recovered materials in the operations phase.
Batteries—vehicles, phones, radios etc. Construction: 60 t Operations: 40 t	Source-separated for removal and recycling by licensed operator.
Waste electrical and electronic equipment Construction: 2 t Operations: 2 t	Establish a waste electrical and electronic equipment (WEEE) collection service with a licensed WEEE recycling operator and/or suppliers.
Printer cartridges Construction and Operations: <1 t	Recycle used or empty laser and inkjet printer cartridges.

General waste type and quantity	Waste management measures
Oils Construction: 9000t Operations: 2000 t	Waste oil would be collected and stored in bunded holding tanks for collection by a licensed contractor for re-use, reprocessing, recycling or disposal. Where possible, pneumatic pumps would be used to transfer waste oil from machinery to bunded storage.
Grease trap waste Construction: 10 t Operations: 3 t	Waste grease would be placed in a bunded storage container. Waste grease would be collected periodically by a licensed waste contractor for re-use, reprocessing, recycling or disposal.
Other regulated waste including hydrocarbon and hydrocarbon contamination Construction: 9000 t Operations: 2000 t	Regulated waste would be stored appropriately for collection and removal by a licensed contractor for treatment. Regulated wastes would be tracked via an approved waste tracking system.
Drums Construction: 20 t Operations: 5 t	Empty drums would be stored in a covered, secure bunded area for periodic collection by a licensed contractor for re-use, reprocessing, recycling or disposal.
Explosives Construction and Operations: <1 t	Explosive materials (blasting residue from the use of Ammonium Nitrate/Fuel Oil explosive, boosters and detonator) would be treated in accordance with Australian Standards (*AS2187.2-2006—Explosives Storage, Transport and Use, Part 2, Use of Explosives)*. Disposal to landfill is not a suitable method of disposal. It is likely that waste explosive materials would be detonated/burnt by emergency response officers. Following detonation, stainless steel casings will be recycled or disposed to landfill. Cardboard packaging can not be removed from site for recycling due to potential explosive residues.
Asbestos (if found during excavation) Construction and Operations: unknown	Asbestos would be removed and disposed by specialist contractor.
Tyres Construction: 1500 t Operations: 650 t	Tyres would be removed by tyre supplier for reprocessing. Alternatively, tyres will be stored for disposal once mine operations commence by burying in overburden at a designated location to be recorded on the Environmental Management Register (EMR) administered by DEHP. In the operations phase, tyre disposal is to be in accordance with the *Operational Policy for the Disposal and Storage of Scrap Tyres at Mine Sites*[29].
Sewage and domestic effluent Construction: up to 750 kL/day Operations: 65 ML	Dedicated package sewage treatment plant (pump out system) would be provided during construction until pipeline connected to permanent sewage treatment plant (STP) on site in the operations phase. Effluent treated to Class A+ quality and re-used on site. Refer to the SEIS, Appendix T4.10 for the Sewage Treatment Management Plan.

[29] Department of Environment and Heritage Protection, *Operational Policy for the Disposal and Storage of Scrap Tyres at Mine Sites*, Department of Environment and Heritage Protection, Brisbane, 2012.

General waste type and quantity	Waste management measures
Sewage sludge Construction: up to 1.5 t/day Operations: 20 t	Dewater on site in package STP. Prior to on-site facilities being operational, sludge would be disposed of off site by a licensed contractor at an existing sewage treatment works at Alpha or Emerald. A package composting facility would also be established to recycle sewage sludge to be used as feedstock to produce soil conditioner for re-use on site. Refer to the SEIS, Appendix T4.10 for the Sewage Treatment Management Plan.

Source: Adapted from SEIS, Volume 2, Appendix T1, Tables T-27 & T-28

Several EIS submitters raised issues regarding the limited availability of adequate waste services and infrastructure capacity in the region to accommodate the types and volumes of waste generated from the project during the initial construction period. In response, the proponent developed an Interim Waste Management Plan (IWMP) for the project (SEIS Appendix T4.01).

The IWMP, a sub-plan of the Mine EMP for the project, provides details of management strategies (such as service providers, transport arrangements, end destinations) for waste streams generated from the construction of the project given the availability and constraints of existing waste management infrastructure and services in the region.

As far as practicable, waste streams would be source-separated for re-use, recycling or reprocessing, and diversion from landfill; however some minor quantities of residual waste would require landfill disposal.

Given the existing constraints on regional landfills and sewage treatment works, on-site facilities, including an engineered landfill, would be developed with priority to maximise on-site waste management opportunities during early works. However, while these facilities are established, within the first 3–6 months of commencing early works, the IWMP states there may be a need to divert minor quantities to regional facilities.

Where on-site management is not feasible, the proponent would establish suitable commercial contracts with licensed operators for transport and processing of waste off site. Operational efficiencies would be sought to overcome the regional constraints of transporting materials over large distances, through provision for bulk collection, storage and service contracts and collaboration with regional partners, such as councils or other mines.

The Mine EMP identifies the following on-site waste and recycling facilities, which would be developed within 3–6 months of commencing early works:

- a sewage treatment plant (STP) and sludge dewatering facility
- a waste management area enabling bulk containment of source separated waste materials
- an engineered landfill to accommodate residual general waste disposal
- a shredder/grinder for chipping/mulching of green waste and waste timber
- a package composting facility for green and food waste, waste timber and dewatered sewage sludge processing
- a crushing facility enabling concrete and brick recycling for road bases
- a compacter and baler to maximise cardboard transport efficiency.

In addition to the IWMP, the proponent would develop the following Mine EMP sub-plans in order to ensure the effective management of general wastes:

- Construction, Operations and Decommissioning Waste Management Plans (refer to section T3.6.6 of the Mine EMP)
- Landfill Design and Environmental Management Plan (an updated version of SEIS Appendix T4.06, to be completed prior to construction in accordance with the relevant DEHP guideline)
- Landfill Operations Plan (to be completed prior to construction and in accordance with the relevant DEHP guideline)
- Sewage Treatment Management Plan (an updated version of SEIS Appendix T4.10, to be completed prior to construction in accordance with the relevant DEHP guideline)

Coordinator-General's conclusions

I am satisfied that the IWMP adequately addresses the issues raised by EIS submitters regarding the availability of adequate waste services and infrastructure capacity in the region to accommodate waste generated during the initial construction period.

I note the on-site waste and recycling facilities to be developed within 3–6 months of commencing early works, and the Mine EMP sub-plans to manage the proposed landfill, STP and general wastes generated during the construction, operational and decommissioning phases of the project.

The proponent must implement the Mine EMP for the project in accordance with the EP Act.

I have stated a number of draft EA conditions (Appendix 1, Schedule E) regarding the management of waste. Under these conditions, the proponent must adhere to requirements associated with landfill, including the location of the facility, acceptable gas levels, permitted waste materials for disposal as well as regulations on the burning of waste.

The proponent must also comply with conditions associated with sewage treatment including discharge points, releases of effluent and restrictions and rules associated with land disposal (Appendix 1, Schedule H).

Based on mitigation measures and management plans provided in the Mine EMP and the requirements of the draft EA conditions, I am satisfied that general waste would be effectively managed over the life of the project.

5.4.3. Mining waste

Context

Mining waste refers to the overburden and interburden, which are the waste rock materials that are required to be mined in order to access coal resources, as well as coarse and fine rejects from the CHPP, which do not have marketable value.

Coarse rejects are larger pieces of overburden which are not suitable for product sale and fine rejects or 'tailings' are generally too high in ash or moisture to be sold. It is estimated that 150 Mt of coarse reject and 70 Mt of tailings would be generated over the life of mine, equating to approximately one-quarter of ROM coal, as well as 3.15 billion tonnes of overburden/interburden.

Potential impacts and mitigation

Potential impacts as a result of mining waste mismanagement include: damage to the health and wellbeing of the community, the biological integrity of surrounding and receiving environments, the suitability of disturbed land for beneficial post-mining land use and visual amenity. This is a result of the following geochemical issues:

- although the majority of the overburden/interburden are likely to be non-acid forming (NAF) due to minor sulphide content, a small proportion (one per cent), which are located close to coal seams, may be potentially acid forming (PAF) (refer to SEIS Appendix E: Geochemical Assessment of Mining Waste)
- coarse rejects may have elevated total sulphur content and minimal capacity to neutralise acids and therefore may be PAF
- some coal and tailings may have a low acid generating capacity, however if the predicted PAF increases then consequently, the acid metalliferous drainage (AMD) may increase.

The Mine EMP identifies the following measures which would be implemented to mitigate these potential impacts:

- the development of an Mining Waste Management Plan (a sub-plan of the Mine EMP) prior to construction (refer to SEIS Appendix T4.07)
- lime treatments would be applied to control pH levels where AMD occurs, with a trigger value of pH=5
- verification of predicted geochemical characteristics through infill drilling programs and ongoing operational characterisation
- geochemical monitoring of mining waste until the variability of the geochemical characteristics are well defined (approximately 12 months)
- results of geochemical monitoring would be utilised in management strategy refinement
- monitoring of surface water and leachate derived from or in contact with mining waste:
  - on a monthly basis and tested for pH and electrical conductivity
  - on a quarterly basis and tested for pH and total dissolved solids
  - on an annual basis and tested for major anions and cations
- potentially impacted waters would be retained on site and re-used in the site water management system (refer to SEIS Appendix M for the basis of design of site water management).

Table 5.5 identifies the specific mitigation measures that would be implemented for the management and storage of coal and mining waste materials.

Table 5.5 Overview of mitigation measures for coal and mining waste materials

Waste material type	Mitigation
Coal	• Contact water contained and segregated from clean site water. • Any acidic contact water (trigger value=pH 5) would undergo lime treatment to control pH.
Bulk overburden/interburden: • NAF • Low salinity and low sodicity	• In-pit and out-of-pit overburden and emplacement facilities. No geochemical management required.

Waste material type	Mitigation
Bulk overburden/interburden: • NAF • High salinity and/or sodicity	• Report to core (internal) of storage facilities. • Avoid placement at the final top surface and final outer slopes and batters of storage facilities.
Uneconomic coal close to economic coal units: • coal ply partings <30 cm thick • coal seam roof and floor materials	• Report to CHPP for processing and become part of coarse reject and tailing material streams.
Uneconomic coal away from economic coal units: • coal ply partings >30cm thick: – NAF – PAF-Low Capacity	• Remain at floor of pit (if pit floor capacity is available) and cover with reduced permeability NAF overburden/interburden within four weeks. • If pit floor capacity is unavailable, report to alternative in-pit storage location, or to coarse reject storage area.
Uneconomic coal away from economic coal units: • coal ply partings >30cm thick: – PAF	• Delineation of PAF units through geological control and ongoing geochemical sampling and testing. • Selectively handling, then report to: – Year 1–2: out-of-pit coarse reject storage areas – Year 2+: in-pit coarse reject storage areas
Coarse reject during years 1 and 2	• Report to low wall edge of the box cut area. • Compact in approximate 1–2 m layers using dozing and compaction equipment. • Cover with reduced permeability NAF overburden within 4 weeks. • Encapsulate with a thick layer (>5 m) of NAF overburden/interburden within 3 months. • Cap with truck-shovel pre-strip overburden and topsoil materials.
Coarse reject from Year 2+	• Report to in-pit voids (coarse reject storage areas). • Compact in approximately 1–2 m layers using dozing and compaction equipment • Cover with reduced permeability NAF overburden within 4 weeks. • Encapsulate with a thick layer (>5m) of NAF overburden/interburden within 3 months. • Cap with truck-shovel pre-strip overburden and topsoil materials.
Tailings	• Placement as piped slurry to the tailings storage facility. • If tailings storage facility decant pH or tailings storage facility seepage collection pH becomes less than pH 5 add sufficient lime to tailings to increase pH to 6.

Source: SEIS, Volume 2, Appendix T1, Table T-29

Coordinator-General's conclusions

I note the findings of the Geochemical Assessment of Mining Waste (SEIS, Appendix E) that the majority of the overburden/interburden is likely to be NAF due to minor sulphide content. I

also note the mitigation measures outlined in the Mine EMP, including a specific Mining Waste Management Plan, to be implemented to mitigate potential mining waste impacts. The proponent must implement the Mine EMP for the project in accordance with the EP Act.

I have stated a number of draft EA conditions (Appendix 1, Schedule F) regarding the management of mining waste. A Mining Waste Management Plan, to be finalised and implemented prior to mining activities commencing, must address and include a CHPP Rejects and Tailings Management Plan and Mining Waste Emplacement Area Operational Plan. Plans must be reviewed and reported on each calendar year for adaptive management.

The mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste (waste rock, spoil, overburden, tailings and course reject material) is appropriately confined and contained prior to decommissioning and rehabilitation (Appendix 1, Schedule F). In addition, the disposal of all PAF coarse reject waste must be encapsulated with NAF mining waste and disposed in a manner such that the coarse reject waste would not cause significant harm to the environment for the foreseeable future.

Based on mitigation measures provided in the Mine EMP and the requirements of the draft EA conditions, I am satisfied that mining waste would be effectively managed over the life of the project.

5.5. Air quality

5.5.1. Introduction

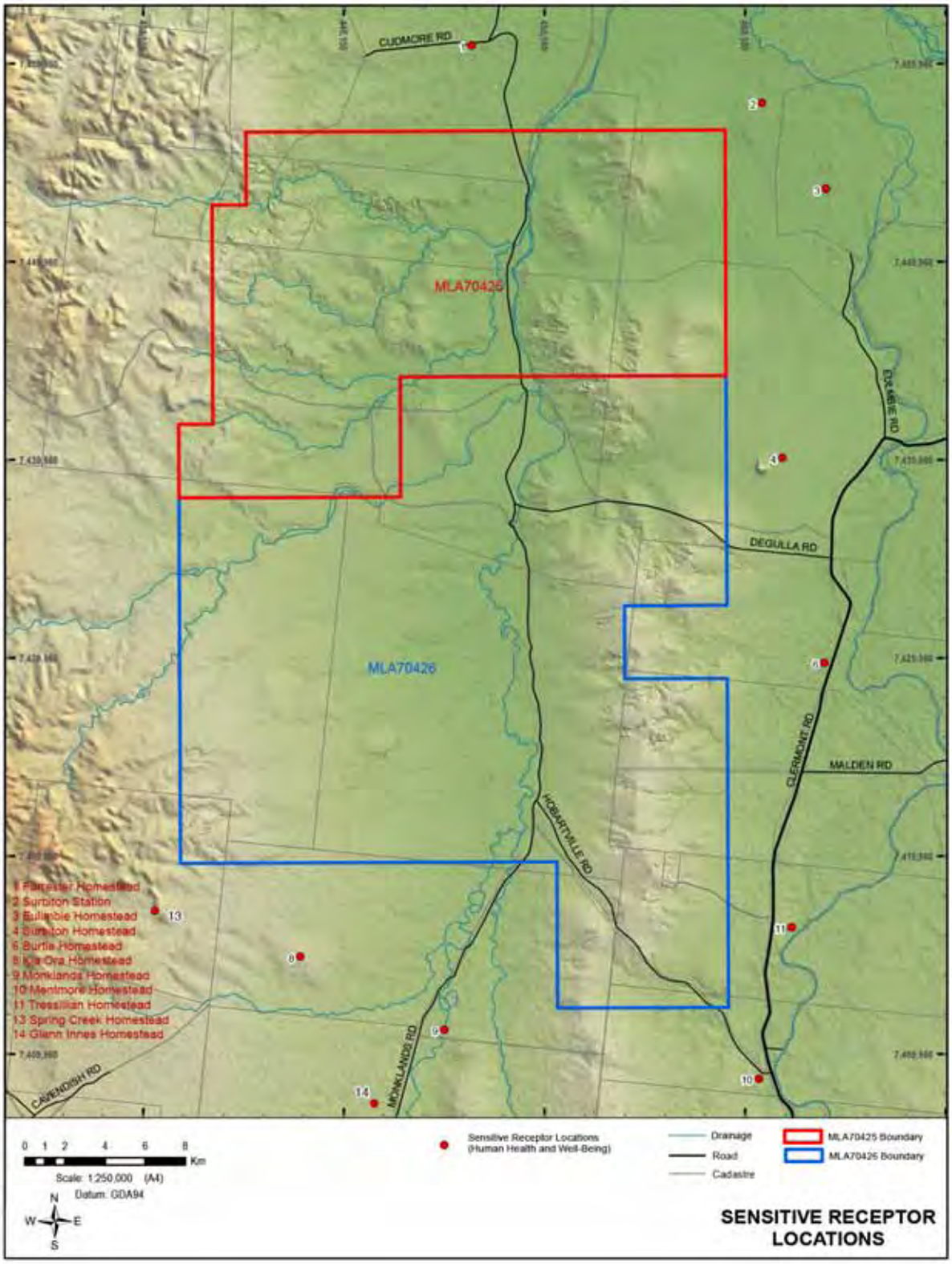
This section of the report evaluates potential impacts of the project on air quality. Coal mining, processing and transportation activities could result in the emission of dust and other particulate matter, potentially impacting on air quality in the vicinity of the project site. Submissions received on the EIS raised issues in relation to:

- the cumulative impact of particulate emissions on sensitive receptors
- the need for adequate measures to prevent coal dust emissions from the transport of coal on the Kevin's Corner rail spur.

In response to the EIS submissions, the proponent refined its air quality modelling (SEIS, Appendix G) to account for changes to the moisture content of overburden and coal, the application of additional mitigation measures and the use of more appropriate emissions factors in determining emissions generation.

5.5.2. Context

Air quality in the project area is typical of this region of Central Queensland and is influenced by agricultural and natural sources such as dust storms and bushfires. The SEIS identified nine sensitive receptors for the project and an additional two that were considered for the cumulative impact assessment of the Kevin's Corner and Alpha Coal projects. These locations are homesteads surrounding the project sites (refer to Figure 5.5).



Source: Map provided by the proponent

Figure 5.5 Map of air quality sensitive receptors for Kevin's Corner

5.5.3. Potential impacts and mitigation

Direct impacts

Air emissions are expected to be generated from project activities associated with blasting, excavation, handling and transporting overburden and coal, and the combustion of fuel in mobile equipment.

The main types of air emissions assessed in the EIS include total suspended particles, of interest for impacts on amenity, particulate matter less than ten micrometres (PM_{10}) and particulate matter less than 2.5 micrometres ($PM_{2.5}$) which are more relevant in relation to impacts on human health.

The SEIS identified that the project would exceed the Environmental Protection (Air) Policy 2008 (EPP (Air)) goals for PM_{10} (to protect human health and wellbeing) at year 5 for one sensitive receptor—Forrester Homestead. This property is to be acquired by the proponent, prior to construction and would be removed as a sensitive receptor once acquired.

The EMPs for the project identify a broad range of measures to manage and mitigate particulate emissions including a monitoring program, dust suppression measures, rehabilitation of exposed surfaces, development of a Coal Dust Management Plan and implementation of measures to mitigate fugitive coal dust release from coal wagons.

The Department of Transport and Main Roads (DTMR) raised concerns that the proposed measures to manage fugitive coal dust emissions from coal wagons on the rail line were insufficient to prevent the loss of coal dust. In response, the proponent has now committed to develop a Coal Dust Management Plan consistent with the QR Network Coal Dust Management Plan[30] and implement either coal surface veneering or full coverage of coal wagons in the EMPs (Commitments 13.11 and 13.2, Appendix 7 of this report).

Cumulative impacts

The assessment of cumulative impacts on air quality (SEIS Appendix O) incorporated modelling for the Kevin's Corner and Alpha Coal projects and found that five sensitive receptors (receptors 1—Forrester, 8—Kia Ora, 9—Monklands, 13—Spring Creek and 14—Glen Inness) could potentially exceed EPP (Air) goals for particulate matter (PM_{10}) in years 5 and 25.

The SEIS noted that the Kevin's Corner project is the only dominant contributor to exceedences at receptor 1 while the Alpha Coal Project is the dominant contributor to exceedences at each of the other four receptors (8, 9, 13 and 14).

Of the sensitive receptors affected:

- receptor 1 is to be acquired prior to construction
- receptors 8 and 9 are located on the Galilee Coal Project (Waratah) mining lease and are expected to be acquired by the Waratah mine proponent and removed as sensitive receptors, if and when that project commences (should these receptors be present once

[30] QR Network Coal Dust Management Plan, V10D, 22 February 2012

the Alpha and Kevin's Corner projects commence, the proponents would be responsible for mitigating the impacts of projects in order to comply with the EPP (Air) goals)

- properties 13 and 14 are sensitive receptors for the Alpha Coal Project (only) and the Kevin's Corner project does not contribute to any of the cumulative impacts on these receptors.

The cumulative impact assessment did not incorporate impacts attributable to the Galilee Coal (Northern Export Facility) project as necessary air quality data was not publicly available. However the SEIS noted that the cumulative impact of the three mines is unlikely to differ significantly from that of the Alpha Coal and Kevin's Corner projects due to the Galilee Coal project being a predominantly underground operation located south of the Alpha Coal mine, 28 km from the Kevin's Corner mining lease.

It is important to note that each of the mines would be subject to an EA condition under the EP Act that would limit dust at any sensitive receptor to acceptable standards for the protection of human health and wellbeing. Each mine would be responsible for monitoring and mitigating the effects on the receptor.

The proponent has committed (Commitment 13.13, Appendix 7 of this report) to participate in any future air quality cumulative impact assessments requested by the regulating authority.

5.5.4. Coordinator-General's conclusions

I am satisfied that the EIS has adequately assessed air quality impacts, both direct and cumulative, for the project.

Mitigation measures required to control impacts on air quality would be implemented through the EMPs for the project. I note that the proponent would be required to implement all measures contained within its EMPs in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have stated draft EA conditions (Appendix 1, Schedule B), which specify dust and particulate matter limit criteria that must not be exceeded at sensitive receptor locations.

I am satisfied that through the implementation of the EMPs and compliance with the draft EA air quality conditions, air quality impacts of the project on sensitive receptors can be managed within acceptable limits.

5.6. Greenhouse gas emissions and climate change

5.6.1. Introduction

This section of the report evaluates the proponent's assessment of greenhouse gas (GHG) emissions and the potential impacts of climate change on the project. GHG emissions would be generated as a result of a number of project activities, such as electricity and fuel consumption in plant and machinery, fugitive emissions of coal seam gas from mining and explosives combustion as a result of blasting.

A number of submissions on the EIS and SEIS raised issues in relation to the proponent's assessment of GHG emissions, including:

- the adequacy of GHG emissions analysis, including the consideration of emissions associated with land clearance and scope 3 emissions
- the associated effects of GHG emissions, including global warming and climate change impacts.

I have considered each submission and how the proponent's supplementary information responded to these issues, as part of my evaluation of the environmental effects of the project.

5.6.2. Context

The proponent is required to report on GHG emissions under the provisions of the *National Greenhouse and Energy Reporting Act 2008* (Cwlth) (NGER Act). The NGER Act prescribes an accounting methodology and requires the publication of results.

Under the NGER Act, boundaries have been established to assist in determining emissions attributable to a project. In terms of emissions boundaries, three scopes have been identified:

- **Scope 1 (direct) emissions**—includes the release of GHG emissions as a direct result of activities undertaken at a facility. They are emissions over which the entity has a high level of control
- **Scope 2 (energy indirect) emissions**—includes the release of GHG emissions from the generation of purchased electricity, steam, heating or cooling consumed by a facility, but do not form part of the facility. Scope 2 emissions are indirect emissions that entities can easily measure and significantly influence through energy efficiency measures
- **Scope 3 (indirect) emissions**—includes all indirect emissions that are not included in Scope 2. They are a consequence of the activities of the facility, but occur at sources or facilities not owned or controlled by the entity. Scope 3 emissions are not defined in NGER Act because reporting them is not mandatory.

In accordance with the NGER Act accounting methodology framework and the TOR for the project, the proponent did not include scope 3 emissions in its assessment of GHG emissions.

Pursuant to the provisions of the *Clean Energy Act 2011 (Cwlth),* the proponent would also incur a carbon tax liability for Scope 1 and Scope 2 GHG emissions attributable to the project.

5.6.3. Potential impacts and mitigation

Greenhouse gas emissions

A GHG emissions assessment for the project was provided in Volume 2, Section 14 of the EIS. In response to submitter comments received on the EIS, the proponent calculated emissions associated with land clearance and updated its emissions inventory to show its relative contribution to the project's total GHG emissions (SEIS, Volume 2, Appendix G).

The SEIS reports that the project's annual GHG emissions would equate to 0.35 per cent of Australia's 2009 GHG emission levels. GHG emissions would be generated as a result of the following activities:

- fugitive emissions of coal seam gas from mining (Scope 1)
- fuel consumption in vehicles and other machinery/equipment (Scope 1)
- explosives combustion as a result of blasting (Scope 1)
- clearance of vegetation (Scope 1)
- electricity consumption in plant and machinery (Scope 2).

Purchased electricity represents the largest contributor to GHG emissions (approximately 83 per cent), followed by fugitive emissions (approximately 13 per cent).

The mine EMP identifies control strategies that would be implemented in order to reduce the release of GHG emissions, including the use of energy efficient equipment, the maintenance of a GHG inventory from the beginning of the construction phase, and the annual reporting of GHG emissions in accordance with the NGER Act.

In addition, the mine EMP outlines commitments to:

- prepare an energy conservation and GHG management plan to ensure all sources of emissions are identified and emission levels are quantified during engineering and design
- conduct gas testing prior to construction in order to better quantify emissions factors and fugitive emissions from coal seams.

Climate change

A climate change impact assessment for the project was provided in Volume 2, Section 14 of the EIS. The assessment used climate change predictions made in the Australian Government's Commonwealth Scientific and Industrial Research Organisation's (CSIRO) *Climate Change in Australia* (2007) report and the Queensland Government's *Climate Change in Queensland – what the science is telling us* (2008) report and evaluated the risks of predicted climate change impacts on mining operations.

Table 5.6 identifies the risk management measures that have been included in the mine EMP in order to address 'high' and 'medium' risk potential climate change impacts.

Table 5.6 Climate change risk management measures

Risk rating	Potential impact	Management measures
High	Increased flood risk	• Apply appropriate risk assessment methods in design of storage dams, levees and diversion channels. • Protect the mine workings and infrastructure from extreme flood events.
Medium	Reduced process water availability	• Use the minimum volume of water necessary in the process circuit. • Recycle waters in the process circuit for other uses, such as dust suppression, as much as possible. • Segregate water by quality or source.
	Increased dust generation	• Limit the extent of site disturbance. • Undertake rehabilitation progressively, including earthworks, drainage and revegetation.
	Unsuccessful rehabilitation planting	• Monitor rehabilitated areas on a regular basis to ensure that original objectives are achieved. Monitoring would include regular inspections for soil erosion, rehabilitation success, weed infestation, and integrity of water diversion drains, waterways and sediment control structures.
	Increased maintenance costs for infrastructure	• Regularly maintain and service all equipment.

Source: Adapted from section 14 of the EIS

5.6.4. Coordinator-General's conclusion

Based on the accounting methodology provided for by the NGER Act and the project TOR, I do not consider that scope 3 emissions should be included in the proponent's assessment of GHG emissions. I am satisfied that the proponent's updated GHG emission assessment presented in the SEIS provides for the adequate assessment of scope 1 and scope 2 GHG emissions associated with the construction and operation of the project. I am also satisfied that the proponent has adequately assessed the potential impacts of climate change on the project.

I note that the EMP measures and proponent commitments would complement other legislative requirements regarding GHG emissions, including reporting on GHG emissions under the NGER Act and the project's carbon tax liability for scope 1 and scope 2 GHG emissions, pursuant to the provisions of the *Clean Energy Act 2011*.

Based on the measures provided in the proponent's Mine EMP and Updated Proponent Commitment Register (Appendix 7 of this report), I am satisfied that the proponent would minimise the release of GHG emissions and the potential impacts of climate change for the life of the project. The proponent must implement the Mine EMP in accordance with the provisions of the EP Act.

5.7. Noise and vibration

5.7.1. Introduction

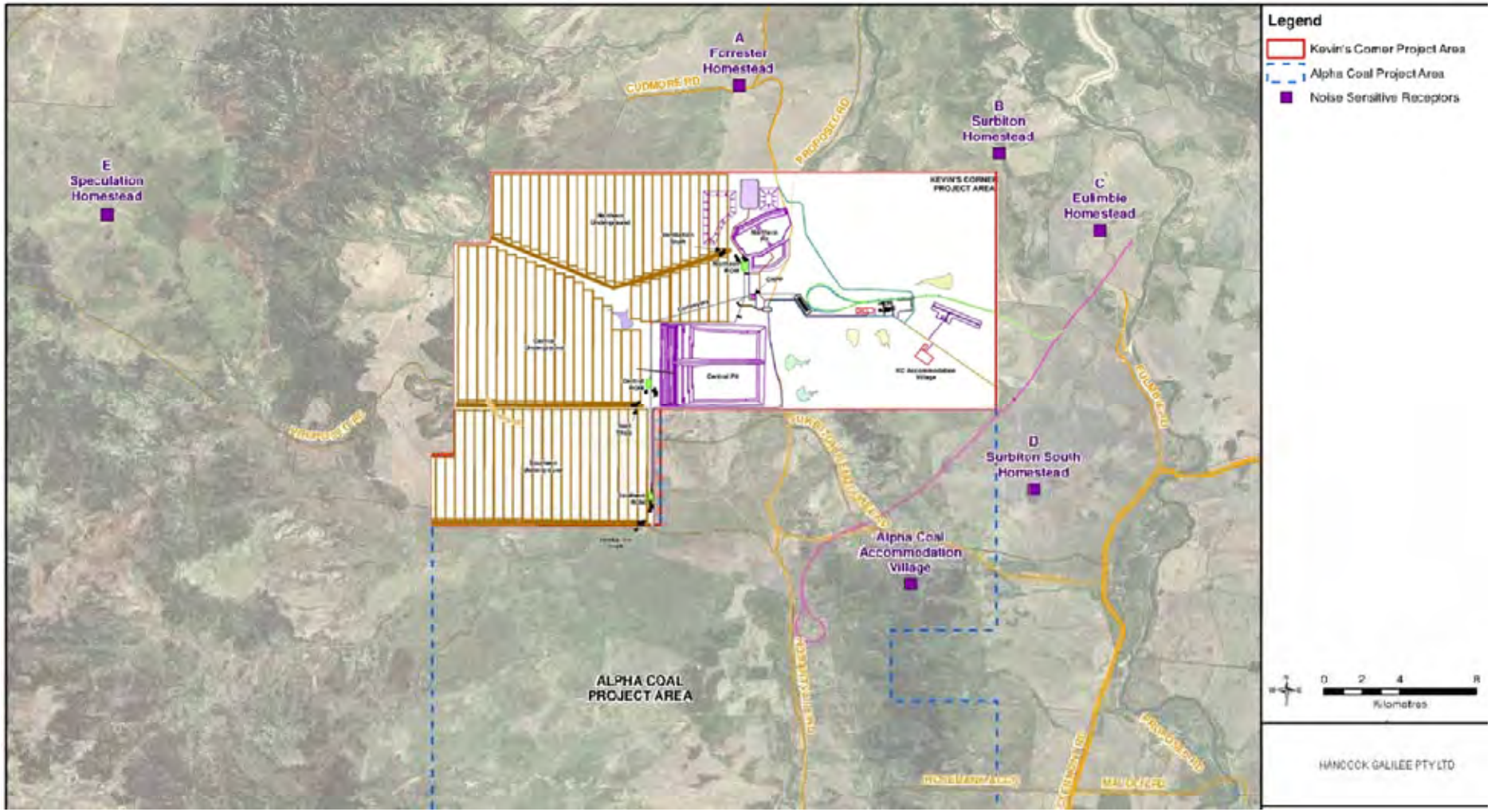
This section of the report evaluates the proponent's assessment of noise and vibration impacts. Noise and vibration would be generated during construction and operation by machinery and equipment, blasting, off-site traffic, rail operations and aircraft.

Some submissions received on the EIS raised issues in relation to the EIS noise and vibration assessment (EIS Section 15 and Appendix P). In response to the EIS submissions, the proponent updated the noise and vibration modelling predictions (SEIS, Appendix H) to account for the detailed design of the rail spur and the assessment of cumulative rail noise impacts against established industrial noise limit criteria.

I have considered each of the EIS submissions and how the SEIS responded to the issues raised. A key issue that required additional consideration was the need to further assess potential noise impacts on sleep disturbance at sensitive receptor locations.

5.7.2. Context

Existing background noise levels in the proposed project area are typical of a quiet rural environment with low-intensity cattle grazing as the primary land use. Birds and insects are the primary source of noise and there are no existing vibration sources in the project area. There are five homesteads in the vicinity of the mining lease and off-lease rail spur (refer to Figure 5.6), which have been identified as noise sensitive receptors. Accommodation villages for the Kevin's Corner and Alpha Coal projects were not included as sensitive receptors as human exposure at this location would be regulated under the *Coal Mining Safety and Health Act 1999 (Qld)*.



Source: adapted from Figures 1-1 and 1-2 of the Revised Noise and Vibration Assessment, Appendix H, SEIS

Figure 5.6 Location of noise sensitive receptors in proximity to the project site

5.7.3. Potential impacts and mitigation

Direct impacts

Noise modelling undertaken by the proponent has indicated that the proposed operation and construction activities for the mine would comply with the established noise limit criteria[31] at sensitive receptor locations without the requirement for any specific noise mitigation measures. Noise generated by off-site traffic, rail construction and aircraft are also within the acceptable limits set out by relevant standards. Modelling has also indicated that low-frequency noise would not cause annoyance to residential receptors.

The EIS reported that vibration effects of blasting are not expected to exceed ground vibration standards at the closest sensitive receptor locations.

Cumulative impacts

Queensland Health raised concerns that the cumulative impacts of rail noise from the Alpha and Kevin's Corner projects on sensitive receptors had not been addressed. In response to this, the updated noise assessment in the SEIS included a study of the cumulative impacts of the Alpha Coal and Kevin's Corner Project railways. It identified that while rail noise levels for the Kevin's Corner Project alone would comply with Queensland Rail's *Code of Practice for Railway Noise Management*, the cumulative impact of the Alpha Coal and Kevin's Corner project rail noise is expected to exceed the sleep disturbance levels recommended by the World Health Organisation (1999) and the Environmental Protection (Noise) Policy 2008 (EPP (Noise)) at the Eulimbie and Surbiton South homesteads.

Mitigation measures

The EMPs for the project set out a range of mitigation measures and monitoring requirements to minimise noise and vibration impacts at sensitive receptor locations. Key mitigation measures include:

- applying effective track and track/wheel engineering techniques to reduce noise
- use of barriers in some sections of the alignment where sensitive receptors are in close proximity
- treating sensitive receptors' dwellings to reduce external noise intrusion to comply with current WHO guidelines
- applying train speed controls within the mining lease and in the vicinity of sensitive receptors to reduce rail-generated noise levels.

[31] Environmental Protection (Noise) Policy 2008.
Environmental Protection Agency, *Guideline: Planning for Noise Control*, Environmental Protection Agency, Brisbane, 2004.
World Health Organisation sleeping conservation criterion.
Queensland Rail, *Code of Practice for Railway Noise Management*, Ver. 2, Queensland Rail, Brisbane, 2007, viewed 9 May 2013, http://www.queenslandrail.com.au/AboutUs/ReleaseOfInformation/Documents/EMS-STD-46-004.pdf.
Department of Main Roads, *Road Traffic Noise Management Code of Practice*, Department of Main Roads, Brisbane, 2007, viewed 9 May 2013, http://tmr.qld.gov.au/business-industry/Technical-standards-publications/Road-traffic-noise-management-code-of-practice.aspx.

5.7.4. Coordinator-General's conclusions

I am satisfied that the EIS has adequately assessed noise and vibration impacts, both direct and cumulative, for the project.

Modelling has indicated that cumulative noise impacts of the Kevin's Corner and Alpha Coal Project rail operations exceed acceptable sleep criteria at two sensitive receptor locations being the Eulimbie and Surbiton South homesteads. The proponent has committed to implement specific measures within the EMP to mitigate impacts on these receptors, and to minimise noise and vibration impacts in general.

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have also stated draft EA conditions (Appendix 1, Schedule D) which specify noise, vibration and airblast overpressure limit criteria that must not be exceeded at sensitive receptor locations.

I am satisfied that through the implementation of the project's EMPs and compliance with the draft EA noise and vibration conditions, noise and vibration impacts of the project on sensitive receptors can be managed within acceptable limits.

5.8. Transport

5.8.1. Introduction

This section of the report evaluates potential impacts and mitigation measures associated with the road, rail and air transport elements of the project. Submissions received on the EIS raised a number of issues in relation to the transport assessment (Volume 1, Section 17) including the:

- adequacy of information on traffic generation and road impacts—in particular impacts of project-generated traffic on existing roads, further details of upgrade and maintenance works, and impacts on current users including users of school bus routes and stock routes
- adequacy of the Road-use Management Plan (RUMP) with further information sought on the management of construction traffic, driver fatigue and safety and the suitability of the proposed routes for construction traffic
- impact of fugitive coal dust on railway infrastructure and the subsequent impacts of this on operations, rail safety and maintenance
- details of the proponent's use of the existing Alpha Aerodrome and the assessment and approvals required for the proposed airport on the project site
- cumulative impacts of the multiple mining projects proposed for the southern Galilee Basin on the road network and consequent upgrade requirements.

The proponent prepared responses to these issues in the supplementary EIS—Volume 2, Appendix J (Revised Road Impact Assessment) and Appendix O (Cumulative Impacts Assessment). These matters are discussed in the sections below.

5.8.2. Context

The project is predicted to generate traffic as a result of the delivery of materials, equipment and consumables, transport of waste and a small proportion of employees expected to use a drive-in-drive-out (DIDO) or bus-in-bus-out (BIBO) method of transport. An on-site airport will minimise impacts of personnel movements on the road network during operation as fly-in-fly-out (FIFO) staff are proposed to be flown directly to the project site rather than transported by road from the Alpha Aerodrome (the nearest aerodrome to the site), or other airports in the region.

In order to assess the worst-case scenario cumulative impacts, the transport assessment was based on the conservative assumption that the project's peak construction phase would coincide with the peak construction phase of the Alpha Coal Project.

5.8.3. Road transport impacts

Existing road network

The road network in the vicinity of the mine site includes local roads controlled by the BRC and state-controlled roads which are managed by DTMR.

Local roads within the vicinity of the mine site include Jericho-Degulla Road, Degulla Road and a number of unnamed gazetted roads which are largely unsealed and primarily used to service local rural properties (refer Figure 5.7).

State-controlled roads most affected by the project include the Capricorn Highway, the Gregory Developmental Road (Gregory Highway) and the Peak Downs Highway, which are fully sealed, two-way, state strategic roads with a maximum speed limit of 100 kilometres per hour; and the Clermont-Alpha Road which is a partly sealed, partly single-carriageway regional road (refer Figure 5.8).

Proposed upgrades to these roads, as identified in the DTMR *Roads Implementation Program 2009–2010 to 2013–2014,* include minor realignments and shoulder sealing on the Capricorn Highway between Emerald and Barcaldine and ongoing regrading works on the Clermont-Alpha Road.

There are a number of designated stock, haulage, school bus and public transport routes in the area which are also expected to be impacted by the project.

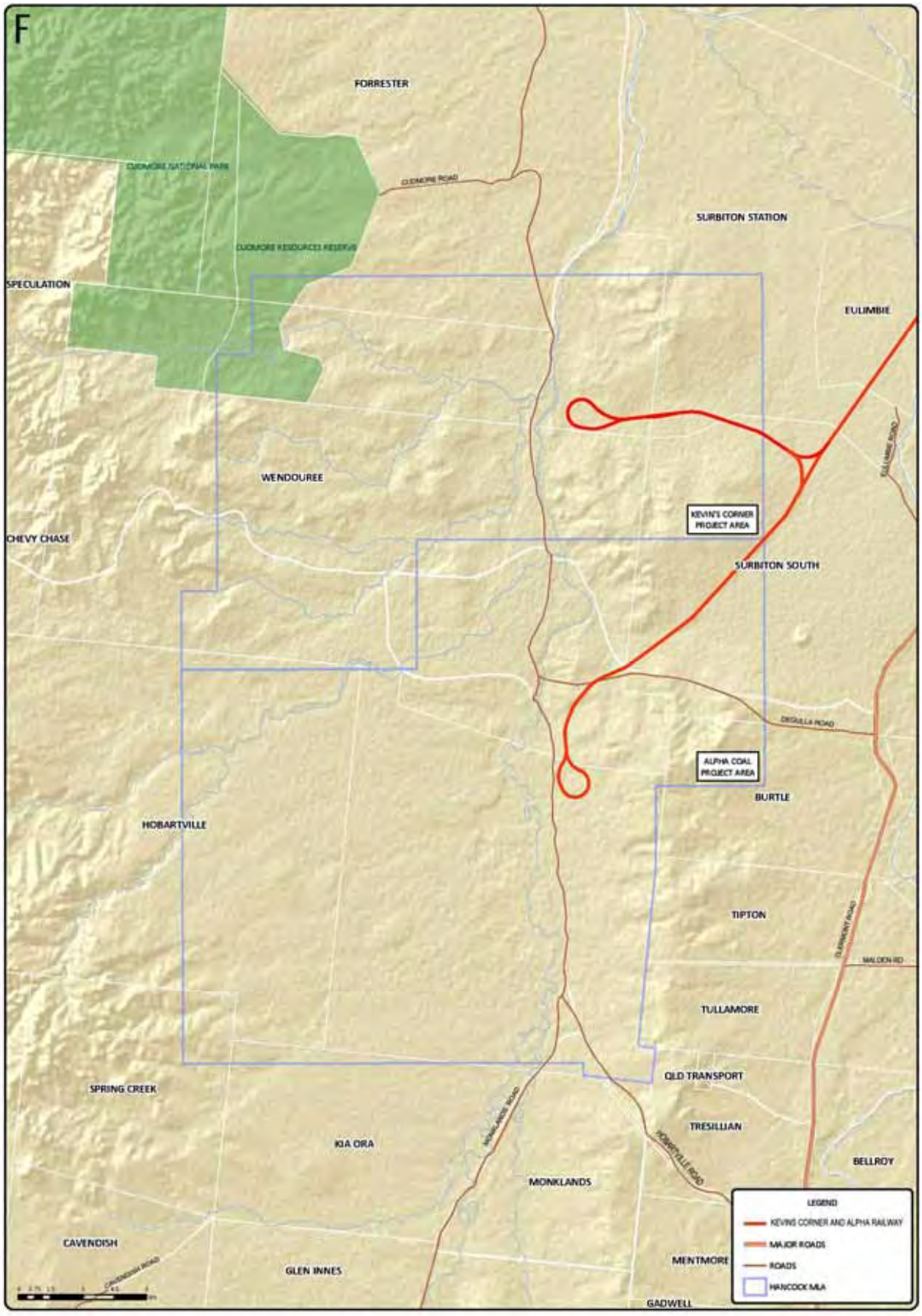


Figure 5.7 Local roads surrounding the project site

Source: SEIS, Appendix J, Revised Road Impact Assessment, Figure 4-4

Figure 5.8 Regional road network

Impacts and mitigation

Road impact assessment

The project is expected to increase annual average daily trips (AADT) during the peak construction and operational periods by the amounts detailed in Table 5.7 below.

The EIS documentation stated that over-dimensional vehicles will originate from Mackay, Brisbane and Gladstone, travelling on the Peak Downs, Gregory, Warrego, Carnarvon, and Capricorn Highways. It also stated that the relatively small number of employees who are expected to use DIDO or BIBO would originate from Alpha, the BRC Area, Emerald and Clermont, using the Capricorn Highway and Clermont-Alpha Road. The proponent has stated that employee traffic will be minimised, as no workers would be permitted to do a daily commute due to fatigue risks. Waste would be transported from the project site to Emerald along the Capricorn Highway for only the very early stages of the project with an on-site land fill facility being constructed as early as possible. These routes are identified in Figure 5.8 above.

In response to concerns raised by DTMR, BRC and the Queensland Police Service (QPS) about the impacts of project-generated traffic on the road network, the proponent has committed to use rail for freight where possible to reduce the impacts of heavy vehicle traffic on the roads (Commitment 17.28, Appendix 7 of this report).

Table 5.7 Project-generated traffic—Average Annual Daily Trips

Vehicle type	AADT during construction phase	AADT during operational phase
Light vehicles	69	33
Commercial vehicles	38	30
Over-dimensional vehicles	8	2

Source: Adapted from SEIS, Appendix J, Revised Road Impact Assessment, Tables 4-4 and 4-5

In accordance with DTMR's *Guidelines for Assessment of Road Impacts of Development*[32] (GARID), the Road Impact Assessment (RIA) focused on those roads (in terms of pavement design life, intersection capacity and road network performance) with a predicted project-related increase in traffic volumes of 5 per cent and above. The RIA was revised for the SEIS (Volume 2, Appendix J) in response to DTMR's submission on the EIS requiring the assessment of additional roads and intersections and the inclusion of additional information.

The revised RIA reported that the project would increase traffic volumes by more than 5 per cent above existing traffic volumes for the Degulla Road, Jericho-Degulla Road, Clermont-Alpha Road (between Hobartville and Degulla Road) and the Capricorn Highway between Alpha and Gemfields.

While the revised RIA in the SEIS provided further information for the purposes of assessing the road impacts, DTMR has requested that the RIA is updated six months prior to the

[32] Department of Transport and Main Roads, *Guidelines for Assessment of Road Impacts of Development*, Department of Transport and Main Roads, Brisbane, 2006.

commencement of construction to incorporate updated project information and changing road conditions. This requirement is included within Appendix 4, Recommendation 10.

Pavement impact assessment

The project is expected to have significant impacts on the pavement life of a 30-kilometre segment of the Clermont-Alpha Road (between Hobartville Road and Degulla Road), Degulla Road, and Jericho-Degulla Road (between Clermont-Alpha Road and the project site). The proponent has committed to enter into infrastructure/maintenance agreements with BRC and DTMR (Commitments 17.5 and 17.6, Appendix 7 of this report) which would include the following road upgrades to accommodate project-generated traffic:

- upgrade of Clermont-Alpha Road to a two-lane, all-weather surface between Hobartville Road and Degulla Road
- upgrade of Degulla Road and Jericho-Degulla Road to a two-lane, all weather surface between Clermont-Alpha Road and the project site.

DTMR requires the proponent to undertake a pavement impact assessment in accordance with the GARID as part of their updated RIA (Appendix 4, Recommendation 10) to determine if any contributions towards the cost of increased maintenance are necessary. Impacts would be assessed for Degulla Road, Jericho-Degulla Road, Clermont-Alpha Road and the Capricorn Highway (between Alpha and Gemfields). Subject to this assessment, the proponent would be required to perform maintenance works or contribute funding based on an Equivalent Standard Axle assessment, as approved by DTMR, where mitigation is required.

DTMR and BRC have raised concerns about safety issues arising from an increase in project-generated traffic on the Clermont-Alpha Road between Clermont and the site. The EIS determined that the road is not suitable for commercial or over-dimensional vehicles and the proponent has committed to including a clause in the heavy vehicle freight contract for all contractors and subcontractors advising that the Clermont-Alpha Road from Clermont to the intersection with Eulimbie Road site is not to be used. The proponent has committed to undertaking spot checks of vehicles arriving at the mine site to monitor compliance (Commitment 17.25, Appendix 7 of this report).

Concerns about the ability of the road to safely sustain increased light vehicle traffic will need to be addressed through further assessment, as required in Appendix 4, Recommendation 10 to ensure vehicle numbers are accurately estimated and any unforseen impacts identified and mitigated.

Road network performance

The revised RIA found that the additional average daily traffic generated by the project using peak transport estimates would be minimal in comparison to the capacity of the road network and therefore would not impact on network performance.

The commencement of the project would result in the part closure of Degulla Road which traverses both the Kevin’s Corner and Alpha Coal mining leases. This impact is expected to be mitigated by the proponent’s commitment to funding and constructing a bypass road from the Degulla road intersection of the Clermont-Alpha Road to link Degulla Road to CNP. The

construction of this bypass would facilitate traffic flow around the active areas of the project site and is specified in Commitment 17.1 (Appendix 7 of this report).

Intersection assessment

The EIS assessed impacts of the project on the intersection of the Clermont-Alpha Road and Capricorn Highway. However, DTMR's submission on the EIS requested that the RIA be updated to include an assessment of two additional intersections on state-controlled roads that would be used by project vehicles—the intersection of the Capricorn Highway and Gregory Highway (north) within the town of Emerald, and the intersection of the Capricorn Highway and Gregory Highway (south) east of Emerald. The revised RIA found that the additional peak-hour traffic generated by the project would not produce any significant incremental impacts on the performance of the three intersections.

The revised RIA found that the intersection of Clermont-Alpha Road and Degulla Road would require upgrading in order to accommodate project-generated traffic and a new intersection would need to be constructed to facilitate access to the project site from Jericho-Degulla Road. The proponent would be required to enter into an Infrastructure Agreement with DTMR regarding the upgrading of affected intersections as determined and agreed upon with DTMR (Appendix 4, Recommendation 11).

School bus routes, stock routes and public transport routes

School bus routes exist along the Capricorn Highway, Gregory Highway, Peak Downs Highway and Clermont-Alpha Road. The proponent has made a commitment to consult with the relevant school bus operators and school principals when developing the RUMP in order to determine the requirements for maintaining safety of children alighting and disembarking from bus services and for the interaction of haulage vehicles and school bus operations (Commitment 17.12, Appendix 7 of this report).

In order to minimise safety concerns relating to the interaction of stock and haulage routes, the EIS identified that designated stock routes currently running beside Clermont-Alpha Road (in use) and Hobartville Road and Degulla Road (currently not in use) should be relocated. The proponent has committed to developing a Stock Route Realignment Strategy in consultation with BRC, relevant state authorities and landholders (Commitment 6.7, Appendix 7 of this report). The strategy proposes measures to address community and agency issues regarding the proposed alternative alignment routes, including BRC's concerns relating to road fencing requirements.

The revised RIA found that project-generated traffic would also have minimal interaction with long-distance bus services traversing the state-controlled road network, which are the only public transport services that would interact with project traffic.

Further measures to monitor and mitigate project impacts

DTMR has requested that the proponent prepare a RUMP, which applies to all activities on the project footprint and incorporates road safety strategies including a fatigue management plan and rest area and stopping place master plan, construction traffic management plans and logistics management plans for standard and over-dimensional deliveries (Appendix 4, Recommendation 10).

Infrastructure/maintenance agreements with DTMR and BRC would also include liaisons regarding the development of a road maintenance program and commitments to provide a proportion of the ongoing maintenance costs of Degulla Road and Clermont-Alpha Road (Appendix 4, Recommendation 11 and Recommendation 15.

Cumulative impacts

The proponent provided an updated cumulative impact assessment of the Kevin's Corner and Alpha Coal projects (Appendix O, section 4.5 of the SEIS) incorporating new data and an updated assessment methodology. It summarised the cumulative impacts of these two projects on the roads used by project traffic and intersection performance but was limited in scope due to uncertainties of publicly available information for the other projects in the region.

The cumulative impact assessment determined that there would be no significant cumulative impact on the road network, even operating under the worst-case assumption of the peak construction periods coinciding for the Kevin's Corner and Alpha Coal projects.

Concerns were raised by DTMR, BRC, community organisations and the public that insufficient analysis of the cumulative impacts of the southern Galilee Basin projects had been undertaken. DTMR recommended that respective Galilee Basin project proponents work together to assess the cumulative impacts of the projects on the road network and determine the mitigation strategies, funding contributions and upgrade works required to deliver a road network that safely and efficiently supports the expected volume of traffic.

DTMR is willing to work with proponents of the Galilee Basin projects in relation to the matters above and has identified a number of potential advantages in taking a coordinated approach, such as proponents contributing joint funding towards required works and assessment of the feasibility of funding a road upgrade program in lieu of ongoing maintenance and rehabilitation contributions.

The proponent has committed to updating the cumulative impact assessment following the completion of the RUMP and further consultation with affected road users (Commitment 17.11, Appendix 7 of this report). Proponent participation in further assessment and mitigation measures for cumulative road network impacts is included in Appendix 4, Recommendation 14.

Coordinator-General's conclusions

I am satisfied that the EIS process has adequately investigated the impacts of the project on the local and state-controlled road networks. I accept the proponent's conclusion that traffic generated by the project would not have a significant impact on the road network and that impacts can be suitably managed.

I support DTMR's view that the proponent must complete required roadworks prior to the commencement of significant construction-related project traffic and have made a recommendation under section 52 of the SDPWO Act that this occur (Appendix 4, Recommendation 4).

I also support DTMR's view that the RIA should be updated in light of more detailed information obtained during detailed project design; and of the need for the proponent to prepare a RUMP, traffic plans and reach agreement with DTMR and BRC on works required

and funding contributions. Accordingly, I have made a number of recommendations within Appendix 4, Recommendation 14 to address these and related matters.

With regard to cumulative road impacts, I am of the view that further work needs to be undertaken to identify these impacts to allow regulators to equitably apportion costs of upgrading/maintaining the road network to multiple Galilee Basin project proponents that otherwise may fall to the state and local authorities. I consider that DTMR is the appropriate agency to oversee this assessment. Accordingly, I have made a recommendation at Appendix 4, Recommendation 14, that the proponent participate in and contribute pro-rata funding to any cumulative RIA that DTMR may commission once reasonable traffic and transport information is available from proponents. I expect that a similar recommendation would be applied to any future Galilee Basin projects.

5.8.4. Rail transport impacts

As detailed in Section 6 of the Kevin's Corner EIS (Land Use Planning, section 6.5.2), the project includes a 17.8 km rail spur which connects with the Alpha Coal project rail line but does not impact upon any existing road or rail infrastructure.

The SEIS identified that there is potential for the proposed rail infrastructure to fragment existing farm land and result in areas of the Surbiton South property being segregated from regular farm operations. The proponent has identified a number of measures to ensure the proposed infrastructure does not detrimentally impact on this property's farm operations in the off-lease EMP. These include:

- consultation with the land holder relating to stock movement across the rail infrastructure and farm management practices
- implementation of land use management techniques to mitigate impacts on the agricultural values of the land
- identification of stock crossing points over or under the proposed infrastructure to facilitate stock movement.

Impacts of the transportation of coal from the Kevin's Corner project along the Alpha to Abbot Point Railway have been assessed as part of the Alpha Coal project, details of which are provided in Volume 3 of the Alpha Coal EIS and evaluated as part of the *Alpha Coal Coordinator-General's Report, May 24, 2012*.

Ecological impacts of the rail spur are assessed in section 5.3 of this report and impacts of coal dust and proposed measures to minimise dust from the transportation of coal can be found in section 5.5, Air Quality.

In its submission on the EIS, DTMR raised concerns about increased traffic on the Clermont-Alpha Road crossing the Western Railway Line at Alpha and requested that an assessment of the existing level of rail level crossing protection be undertaken. On the proponent's request, Queensland Rail undertook a desktop assessment (Appendix B of Appendix J, Revised RIA, SEIS) which provided proposals for works to be undertaken to implement additional safety measures at the crossing. I have made a recommendation in Appendix 4, Recommendation 5 pursuant to section 52 of the SDPWO Act that the works identified in this assessment be completed and audited in order to ensure compliance with the appropriate standards.

DTMR also raised concerns about the impact of fugitive coal dust on railway infrastructure and the consequential impacts of this on operations, rail safety and maintenance. A recommendation has been provided at Appendix 4, Recommendation 13 to mitigate this issue via the implementation of an appropriate coal-dust management system such as veneering or fully covering the coal wagons in accordance with the QR Network Coal Dust Management Plan[33].

The section of the rail spur located within the mining lease is subject to conditions of the draft EA (Appendix 1) and a number of conditions have been stated (Appendix 2) in relation to the off-lease section of the rail spur.

5.8.5. Air transport impacts

An on-site airport is proposed to service the project's FIFO workforce and support the project's materials logistics strategy as well as potentially allow access for other airport users. The proponent has chosen to build an airstrip on-site rather than using the Alpha Aerodrome, which is located 75 km from the proposed Kevin's Corner Airport, to:

- facilitate the landing of large aircraft with the capability to fly between the site and a range of state and national destinations
- reduce employee travel distance—a key consideration of the fatigue management strategy
- reduce vehicle numbers on regional roads, and therefore reduce cumulative impacts of traffic on the Alpha township
- provide a location for emergency services to land on-site for rapid response to an event on the project site.

The impacts of an on-site airport on the transport network may include additional third-party heavy vehicle traffic associated with airport operations such as transport of aviation fuel and emergency response traffic and procedures in the event of an emergency. The impacts on sensitive receptors from noise generated from the airport are addressed in section 5.7. In order to mitigate the impacts of having an airport on the project site, the proponent has committed to:

- developing and implementing an airport environmental management plan and a plan of operations to address flight path issues and hours of operations
- developing and implementing operational procedures relating to aircraft, to address noise and visual impacts
- conducting ongoing negotiation and consultation with surrounding landholders.

These commitments are set out in Commitment 6.5 of the Updated Proponent Commitment Register (Appendix 7 of this report). Construction and operation of the airport will also be required to meet the conditions set out in the draft EA.

The proponent has advised that aerodrome certification for the new airport will be sought from CASA as part of the Tier 2 approval process. The airport and associated facilities will be designed to adhere to the Civil Aviation Safety Regulation 139.050.

[33] QR Network Coal Dust Management Plan, V10D, 22 February 2012,

BRC raised concerns in its submission on the EIS that there was insufficient information about the proponent's proposed use of the Alpha Aerodrome in the early stages of the construction period. I have recommended that the proponent execute a transport infrastructure agreement with BRC that addresses the construction, upgrade and maintenance of transport infrastructure, including the Alpha Aerodrome (Appendix 4, Recommendation 15).

5.8.6. Coordinator-General's conclusions

I am satisfied the EIS assessment has identified the potential impacts of the project on traffic and transport and that these impacts can be adequately managed. I support DTMR's requirements for additional work to be completed when updated information is available and recommend that the proponent collaborate with all other proponents undertaking projects in the Southern Galilee Basin with regard to mitigating the cumulative traffic impacts of the project.

5.9. Hazard and risk

5.9.1. Introduction

This section of the report evaluates the hazards and risks of the project, including health and safety matters. A number of submissions on the EIS and SEIS raised issues in relation to the proponent's assessment of hazard and risk, including:

- emergency response and safety procedures
- the need for consultation with emergency services and compliance with health and safety legislative requirements
- health concerns associated with the project's potential to generate and harbour disease vectors as well as the risk of spreading communicable diseases
- concerns associated with the risk of equipment and dam failure and potential health impacts
- concerns associated with road and transport safety.

I have considered each submission and how the provided supplementary information responded to these issues as part of my evaluation of the environmental impacts of the project.

My evaluation of the potential impacts and mitigation associated with road and transport safety, as raised in submissions, is discussed in section 5.8. Refer to other sections of this report for my assessment of potential impacts to groundwater (section 5.1), surface water (section 5.2), air quality (section 5.5), noise and vibration (section 5.7), and community wellbeing (section 6). For my assessment of the potential impacts of climate change on the project refer to section 5.6 of this report.

5.9.2. Context

Statutory legislation (and related subordinate legislation such as Regulations, Codes of Practice, Australian Standards and other guidance materials) establishes the minimum standard by which activities for this project must be undertaken. Legislation of particular relevance includes, but is not limited to:

- *Workplace Health and Safety Act 2011* (Qld) (WHS Act), which outlines the laws regarding health and safety matters in workplaces
- *Workplace Health and Safety Regulation 2011* (Qld), which supports the general duties and procedural/administrative matters under the WHS Act
- *Coal Mining Safety and Health Act 1999* (Qld) which sets obligations relevant to the design, construction and operation of a coal mine
- *Coal Mining Safety and Health Regulation 2001* (Qld), which prescribes ways of achieving acceptable levels of risk at a coal mine
- *Explosives Act 1999* (Qld), which sets out the requirements for handling, storing, transporting and manufacturing explosives

- *Australian and New Zealand Standards AS/NZS ISO 31000 (2009) Risk management – Principles and guidelines* (ISO 31000), which provide principles and generic guidelines on risk management
- *ISO 14001 Environmental Management System* and *AS/NZS4801 (2201) Occupational health and safety management systems – Specification with guidance for use* (ISO 14001), which sets out the criteria for an environmental management system.

Section 24 of the EIS outlines the proponent's hazard and risk assessment of the project in accordance with the guidelines of ISO 31000. This has allowed the proponent to identify, prioritise, manage and compare risks and hazards of the project that could potentially result in a health and safety impact. Section 22 of the EIS provides for potential health and safety impacts and management. In general, safety management for the project has been structured on the model outlined in ISO 14001.

5.9.3. Potential impacts and mitigation

The hazard and risk assessment identified 124 potentially significant risks, 94 on the project site and 30 off-site, predominantly related to: the alteration of surface topography; transport incidents; leakage and spillage; ground failure; dam and equipment failure; natural disasters; and community/workforce health and safety issues.

The risk register, presented in the EIS (Appendix U), describes all potential risks and hazards of the project, their probability, potential consequences, severity and residual risk ratings. Each risk and hazard of the project would be mitigated through specific measures as outlined in the risk register which the proponent has committed to implement (Commitment 24.1, Appendix 7 of this report).

Health and safety management system

A Health and Safety Management System would be developed and implemented as an overarching framework for the management of hazards and risks of the project and the health and safety of the workforce and wider community (Commitment 24.22 and 24.23, Appendix 7 of this report). This would be established pursuant to the relevant legislative requirements and in consultation with State emergency services and BRC.

The system would include all requirements for Principal Hazard Management Plans and Standard Operating Procedures such as training site personnel to the standard required to develop skills and attain relevant licences; conducting industry-recognised inductions; undertaking on-site competency testing; regular safety inspections and audits; and health and medical checks of on-site personnel. A range of sub-plans would also be developed and implemented as part of the system to appropriately manage hazards and risks and health and safety.

Hazard and risk

An Emergency Management and Response Plan would be developed as part of the Health and Safety Management System to include detailed information on the nature of emergency situations that could arise, emergency management structures, notification and escalation procedures, mine site layout, emergency response procedure and trigger action response plans (Commitment 24.25, Appendix 7 of this report).

As identified in Commitment 24.33 of Appendix 7, the Health and Safety Management System would also contain plans to address the following hazards and risks:

- fire management (equipment, buildings or vehicle fires)
- bushfire management
- diesel/fuel/oil spill management
- dangerous goods and explosives management
- vehicle breakdown management
- high wind management
- storm response management
- flood management
- mine rescue.

To ensure no extra demand is placed on existing local emergency services and the quality of service is not compromised, the proponent has committed to provide all resources, training and equipment required for first-response capability (Commitment 24.9, Appendix 7 of this report). This includes one fully equipped ambulance and five years of funding for supporting resources for that ambulance (Commitment 27.0). In the event that bushfire occurs, the local rural fire brigade would be relied upon. However, the proponent would supplement existing resources, capability and equipment (Commitment 24.10, Appendix 7).

Health and safety

In response to submissions made by Queensland Health (QH), the proponent has committed to integrate measures to safeguard workers and local residents from the spread of communicable diseases as part of the Health and Safety Management System (Commitment 22.2, Appendix 7 of this report). Awareness of harmful species such as local dangerous snakes and spiders would also be promoted through staff training and inductions, and site personnel would be required to wear appropriate personal protective equipment, use insect repellent and have access to first aid kits (Commitments 24.34 and 24.35, Appendix 7).

As identified in Commitment 22.8 (Appendix 7) of the Updated Proponent Commitment Register, the Health and Safety Management System would also address the following workforce health and safety related impacts:

- security management to prevent unauthorised access to hazardous areas, restrict the use of equipment where appropriate training has not been obtained, and outline processes required for visitor access
- pest management (human health), as requested by QH, to address the project's potential to generate and harbour disease vectors associated with pests that pose risk to human health
- mosquito management (with reference to QH's *Guidelines to minimise mosquito and biting midge problems in new development areas*[34].

[34] Queensland Health, *Guidelines to minimise mosquito and biting midge problems in new development areas*, Queensland Government, 2002.

Additionally, in order to mitigate the risk of adverse health impacts, as requested by QH, food served within the project site would be done in compliance with the *Food Act 2006* to maintain appropriate hygiene levels (Commitment 22.7, Appendix 7).

The proponent has not identified any health and safety impacts on the Alpha township (located approximately 65 km away) and therefore, no specific impact mitigation actions have been proposed. However, it is likely that the implementation of the Health and Safety Management System and its sub-plans would also result in benefits to the community.

Draft EA requirements

In addition to the implementation of the Health and Safety Management System and its associated sub-plans, risk management is addressed in the draft EA conditions I have stated for this project (Appendix 1, Schedule A). The proponent must develop and implement a risk management system for the construction and operation of the project, pursuant to ISO 31000 or to the latest edition of an Australian Standard (Appendix 1, Schedule A).

The proponent must also notify the administering authority of emergencies and incidents, including the release of contaminants not in accordance with EA conditions, and report on the outcomes of actions to manage any incidents, including the actions proposed to prevent recurrence (Appendix 1, Schedule A).

In order to ensure regulated structures (i.e. dams and levees) are designed to accommodate extreme weather events, conditions contained in the draft EA (Appendix 1, Schedule G) specify the design requirements and hydraulic performance criteria that must be addressed as part of the detailed design and operation of regulated structures.

The stated draft EA conditions also set a number of requirements for the effective management of impacts to air quality (Appendix 1, Schedule B), noise and vibration (Appendix 1, Schedule D) and water (Appendix 1, Schedule C) which would also assist in mitigating health and safety risks to the project workforce and broader community.

5.9.4. Coordinator-General's conclusions

Based on the mitigation measures provided in the risk register, the proposed Health and Safety Management System and associated sub-plans to manage hazard, risk, health and safety impacts (as specified in the Updated Proponent Commitment Register, Appendix 7 of this report), as well as the comprehensive requirements of the draft EA conditions, I am satisfied that the hazards and risks of the project and potential health and safety impacts would be appropriately managed throughout the life of the project.

5.10. Cultural heritage

5.10.1. Introduction

This section of the report evaluates potential impacts on Indigenous cultural heritage (ICH) and non-Indigenous cultural heritage (NICH) sites and items. Submissions received on the EIS raised the following relevant issues:

- completion of ICH surveys and the protection of ICH sites and artefacts
- how NICH sites will be catalogued and recorded.

I have considered each submission and how the proponent's supplementary information responded to these issues as part of my evaluation of the environmental impacts of the project.

For information on Indigenous issues in relation to the broader social and economic opportunities and impacts for the local community and region, refer to section 6 of this report.

5.10.2. Indigenous cultural heritage

Context

ICH in Queensland is protected under the ACH Act. To comply with the duty of care provision under section 23 of the ACH Act, proponents of projects which require an EIS must prepare a CHMP which provides for the management of ICH.

In accordance with the ACH Act, the proponent has developed a CHMP for the entire project area, in consultation with the native title claimants; the Wangan and Jagalingou People (file no. QUD85/04). This confidential agreement was registered by the Chief Executive of the former Department of Environment and Resource Management (DERM) on 18 January 2010 and exists solely between the proponent and the native title claimants.

Section 29 of the Commonwealth *Native Title Act 1993*, provides for the 'Right to Negotiate' (RTN) process, a procedure between the proponent and native title claimants to negotiate over proposed future acts and management of land and waters. Under this duty of care requirement, various Indigenous Land Use Agreements (ILUAs) were developed for the off-lease portion of the project and registered between July and September 2011. The Queensland Government supports the use of ILUAs as the process provides a framework for resolving native title issues through negotiation rather than costly and time-consuming litigation.

Potential impacts and mitigation

Impacts on ICH were addressed in Volume 1, Section 18 of the EIS.

Desktop searches of the former DERM register and database identified the presence of a ceremonial area on Wendouree Station, which was later confirmed as part of targeted cultural heritage surveys. To protect this culturally significant site from direct project impacts and in accordance with the CHMP, the proponent will develop a specific management plan with the Wangan and Jagalingou People.

Field surveys undertaken by representatives of the Wangan and Jagalingou People also identified the presence of scattered stone artefacts, isolated stone artefacts and scarred trees on the project area. The EIS reported (Volume 1, Section 18.3.4) that a similar pattern of archaeological findings is expected to emerge as part of additional cultural heritage surveys to be undertaken prior to project construction (as required in the CHMP), including:

- isolated stone artefacts or stone artefact scatters
- scarred trees where bark has been removed for a variety of uses including assembling shelters, canoes, shields, containers or for hunting purposes
- carved trees, which feature carvings associated with burial and ceremonial areas
- camp sites, which incorporate fireplaces and stone artefact scatters
- natural features of cultural significance such as creeks, billabongs, mountains and rocks
- quarries and stone resource areas where stone tools were sourced
- ceremonial areas in addition to the known area at Wendouree Station
- areas which may consist of an array of native food plants.

Potential impacts on items/sites of ICH as a result of the project may arise from the removal of ground surface surrounding the open pits, the development of the tailings dam and overburden emplacement areas, as well as subsidence from the three underground mining areas.

In the event that an object of ICH is found, the proponent would implement the mitigation measures identified in the EMPs and CHMP for the project, including:

- detailed recordings
- systematic collection and removal from disturbance area
- collection of information from the context of the area/object
- the development of a monitoring program during disturbance
- preparation of site-specific management plans in order to avoid and/or mitigate harm to matters of ICH
- regular cultural awareness training for employees including avoidance, protection and obligations.

Coordinator-General's conclusions

Based on the mitigation measures provided in the EMPs for the project, the registered CHMP and ILUAs and the legislative requirements of the ACH Act and Native Title Act, I am satisfied that impacts on ICH would be appropriately managed throughout the life of the project.

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I consider that the implementation of the EMPs would satisfy the duty of care requirements under the ACH Act and *Native Title Act 1993*, and would ensure adequate identification and management of cultural heritage places and objects by the proponent and Wangan and Jagalingou People as custodians of their cultural heritage.

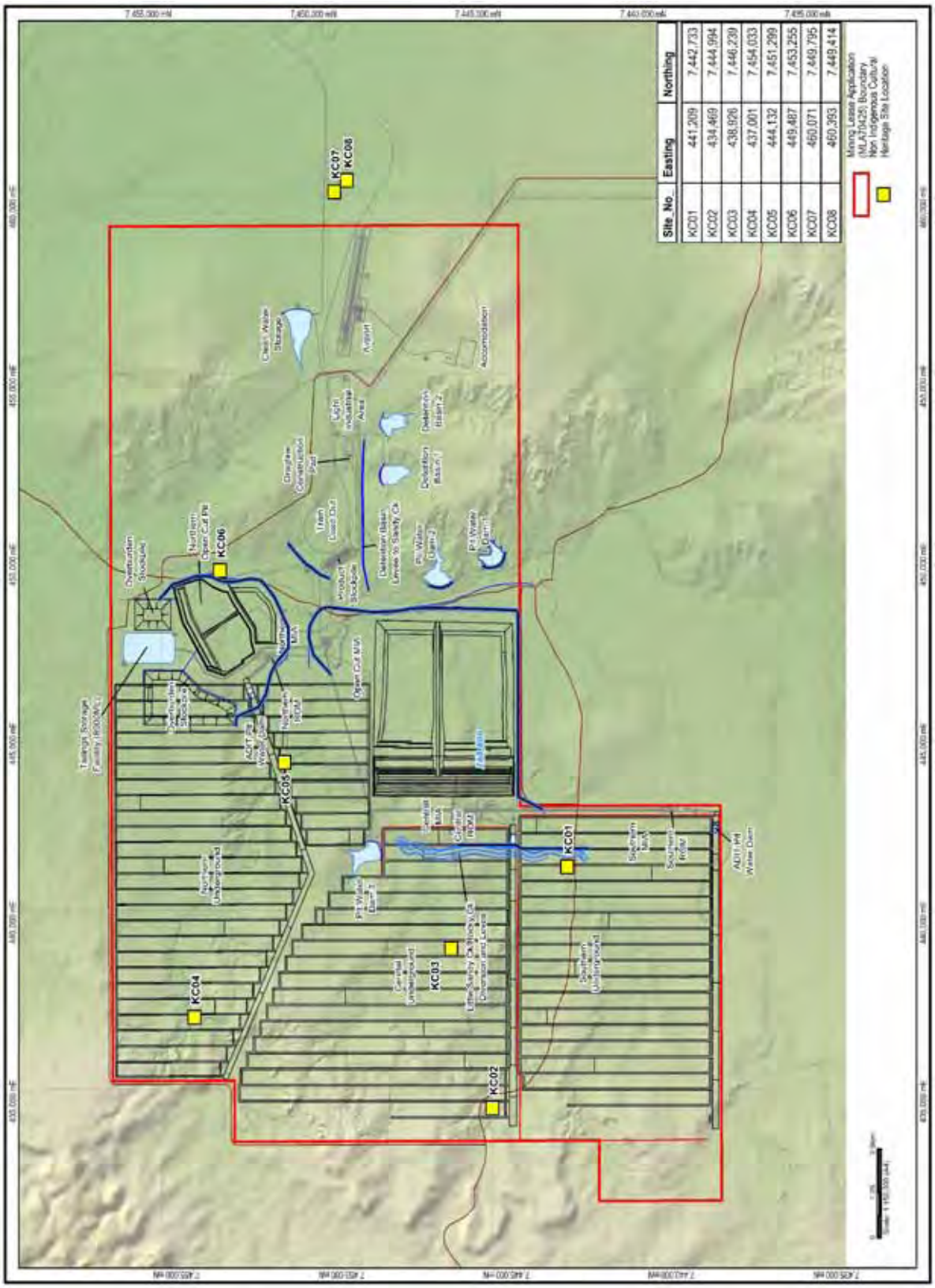
5.10.3. Non-Indigenous cultural heritage

Potential impacts and mitigation

Impacts on NICH were addressed in Volume 1, Section 19 of the EIS.

The project area does not contain any sites listed on the national, state or local government NICH registers. Appendix S of the EIS provides an assessment of unlisted sites, according to criteria in the *Queensland Heritage Act 1992* (QH Act). This assessment found that six unlisted NICH sites were found within the mining lease area as well as two sites which are located off lease in proximity to the proposed rail spur corridor. The location of these sites is presented in Figure 5.9. One site is directly associated with the late nineteenth-century coach route network.

Table 5.8 identifies the likely impacts of the project on each of the NICH sites as well as the cultural significance and associated grading of each site in accordance with QH Act criteria.



Source: EIS, Volume 1, Section 19, Figure 19-2

Figure 5.9 Location of NICH sites

Table 5.8 NICH sites, significance and potential impacts

Site	Name	Cultural significance	Significance grading	Potential impact
KC01	Burgess Hotel (artefactual surface scatter and subsurface remains)	• directly associated with a late nineteenth-century coach route network	• fulfils criteria for local listing • may fulfil criteria for State listing	Likely to be directly impacted in order to accommodate the proposed creek diversion
KC02	Rocky Creek Camp (artefactual surface scatter and subsurface remains)	• potentially indirectly associated with the late nineteenth-century coach route network • likely to be associated with the late nineteenth and early twentieth-century stock route network	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Likely to be impacted by subsidence as a result of underground mining
KC03	Borehole and Sheep Trough	• related to twentieth-century pastoral activity and improvements	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Likely to be impacted by subsidence as a result of underground mining
KC04	Cudmore Cottage (complete structure with general household goods)	• related to twentieth-century pastoral activity (sheep shearing and droving)	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Likely to be impacted by subsidence as a result of underground mining
KC05	Wallaroo Complex (shearing shed and holding yards)	• related to twentieth-century pastoral activity (sheep shearing and droving)	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Likely to be impacted by subsidence as a result of underground mining
KC06	Gate Post	• related to twentieth-century pastoral activity and improvements	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Directly impacted to accommodate the northern open cut pit
KC07	Marsupial-Proof Boundary Fence	• associated with twentieth-century pastoral activity	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Potentially impacted by off lease infrastructure
KC08	Six Mile Homestead Complex (former house site with remnant concrete and demolition material)	• associated with twentieth-century pastoral activity	• may fulfil criteria for local listing • does not fulfil criteria for State listing	Potentially impacted by off lease infrastructure

Source: Adapted from EIS, Volume 1, Section 19, Tables 19-1 and 19-2 & EIS, Volume 2, Appendix S, Tables 6.1 and 6.3

The EMPs for the project include the following measures to mitigate potentially adverse impacts on NICH sites:

- developing an archaeological management plan (AMP) prior to construction, which outlines mitigation measures to protect and conserve cultural heritage values of sites associated with the nineteenth-century coach route within the MLA for the life of the project (construction, operation and decommissioning). This would include site KC01 Burgess Hotel and KC02 Rocky Creek Camp. The AMP would outline site-specific guidelines and management protocols for previously identified sites as well as incidental finds
- undertaking archival recordings of the structure and contents of Cudmore Cottage, prior to disturbance, including photographs, site plans and related drawings
- implementing an unexpected finds procedure
- ensuring the presence of an on-call historical archaeologist during the construction phase of the project
- ensuring compulsory notification to DEHP of any relevant finds in accordance with the QH Act
- undertaking annual checks of the condition of all heritage items and sites
- undertaking five-yearly surveys of cultural heritage items and sites to determine any adverse impacts associated with mining activities such as subsidence
- training staff in cultural heritage identification and obligations associated with unexpected finds
- developing cultural heritage policies for existing sites or new finds.

Coordinator-General's conclusions

Based on the mitigation and recording measures provided in the EMPs and the legislative requirements of the QH Act, I am satisfied that the impacts on NICH would be appropriately managed throughout the life of the project.

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

5.11. Land disturbance and rehabilitation

5.11.1. Introduction

Submissions on the EIS and SEIS raised a number of issues in relation to potential land disturbance impacts, including:

- rehabilitation and final land use
- soil management
- subsidence
- contamination
- impacts on CRR.

I have considered each of the submissions and how the SEIS and subsequent information received from the proponent (including the updated RMP, May 2013) has responded to submitter issues as part of my evaluation of the environmental impacts of the project.

Section 5.4 of this report provides my assessment of potential impacts associated with general and mining waste arising from the project.

Refer to other sections of this report for my assessment of potential impacts on groundwater resources (section 5.1), surface water resources (section 5.2), ecological values, including CRR, (section 5.3) and transport (section 5.8).

5.11.2. Context

The grazing of cattle is the main current land use within the proposed mining lease area. Much of the area is either cleared or partially cleared. Several isolated areas have been cropped for fodder species to supplement grazing on native and introduced pastures. Other land uses include:

- bushland (remnant mid-height woodland dominated by Boxwood and Ironbark)
- formed and unformed roads
- farming infrastructure (including access tracks, fences, stockyards and sheds)
- nature conservation (CRR)
- coal and mineral resource exploration
- areas of ICH and NICH.

The proposed mining lease would impact upon five separate private land holdings as well as part of the protected area known as CRR. The project would also impact designated stock routes currently traversing the mining lease area, including stock routes running beside Clermont-Alpha Road (in use) and Hobartville Road and Degulla Road (currently not in use).

Surrounding the mining lease area, ten homesteads (rearing livestock as their primary use) are located within a 25 km radius of the proposed mining lease. Table 5.9 provides an overview of the six affected properties. Figure 5.10 shows the surrounding land uses.

Table 5.9 Overview of affected properties

Property name	Property description	Tenure type	Size (ha)	Affected lands (ha)	Primary use
Forrester	Lot 1788 on PH886	Leasehold	42 475	11 406	Cattle grazing
Surbiton	Lot 681 on PH406	Leasehold	20 719	3523	Cattle grazing
Surbiton South	Lot 3533 on PH56	Leasehold	19 165	2918	Cattle grazing
Wendouree	Lot 4994 on PH2232	Leasehold	38 800	17 518	Cattle grazing
Hobartville	Lot 649 on PH1981	Leasehold	56 200	461	Cattle grazing
Cudmore Resources Reserve	Lot 1007 on NPW632	Resources Reserve	6 900	1673	Protected area

Source: SEIS Appendix T1, Table T-30

CRR, listed under Schedule 4 Resources Reserves of the Nature Conservation (Protected Areas) Regulation 1994, extends over 1 673.5 ha of the north-western corner of the project area. This reserve has been created recognising its ecological and cultural values as well as the interest in the land for mining purposes. The reserve provides an extension to the ecological values present within the CNP, located approximately 700 m west of the western mining lease boundary.

Resources reserves are protected and managed under the NC Act to protect and provide for the 'controlled use' of cultural and natural resources and 'ensure that the area is maintained predominantly in its natural condition' (Part 4, Schedule 21 of the NC Act). The CRR is under the joint trusteeship of the DNRM and the DNPRSR. In accordance with the NC Act, the proponent must seek from DNPRSR and DNRM approval for an 'Authority to undermine a Protected Area'. Refer to section 5.3 of this report for information on potential impacts on the nature conservation values of the CRR.

Section 5 of the EIS reports that the project area is largely covered by Class C1 land with some areas of Class C3, and minor patches of Class D (in accordance with the Classification of Agricultural Class Land mapping[35]). These classifications are generally associated with land that is suitable for beef cattle grazing and not rainfed cropping.[36] The EIS states that the project does not lie within a potential strategic cropping land area.

The project site contains no lots listed on DEHP's EMR and Contaminated Land Register (CLR). A site inspection conducted in 2010 indicated some minor contaminated areas resulting from fuel storage, waste oil storage and minor pesticide and herbicide use (refer to EIS Appendix K for more information).

[35] Department of Primary Industries & Department of Housing, Local Government and Planning, *Planning Guidelines: the Identification of Good Quality Agricultural Land*, Department of Primary Industries & Department of Housing, Local Government and Planning, Queensland, 1993.
[36] As described in the *Land Suitability Assessment Techniques*; DME, 1995

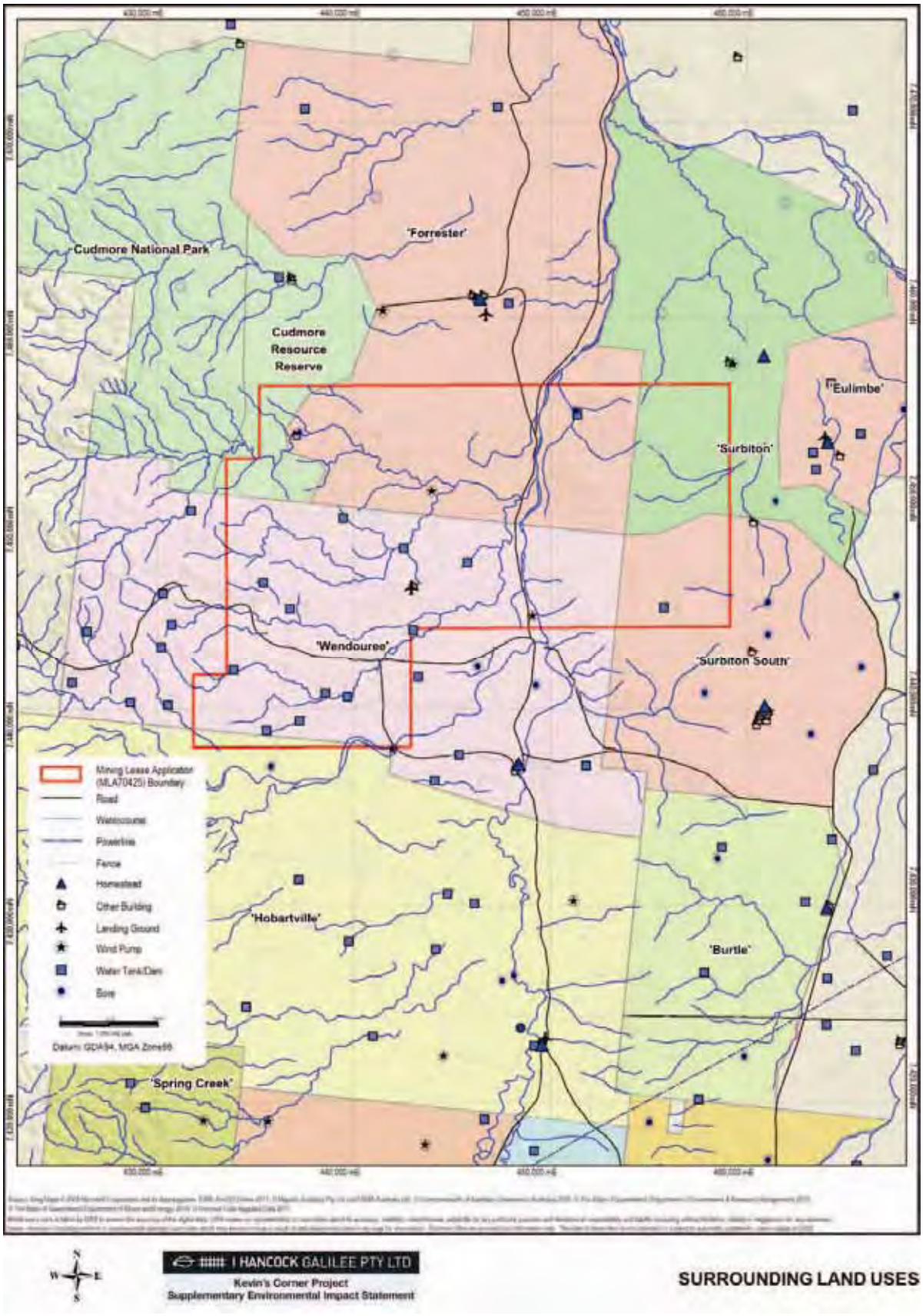


Figure 5.10 Land uses in the project area

5.11.3. Potential impacts and mitigation

Chapter 2 of this report identifies the maximum land disturbance areas as a result of the project, including:

- infrastructure, roads and tracks (Domain 1—2 566 ha)
- pits, voids and overburden emplacements (Domain 2—3 315 ha)
- TSF (Domain 3—420 ha)
- dams and surface water features (Domain 4—360 ha)
- modelled subsidence impact on high value state significant biodiversity value (SSBV) vegetation (Domain 5—632 ha)
- other lands (includes exploration, groundwater monitoring bores and underground mining) (Domain 6—30 087 ha).

Direct impacts on land owners and existing agricultural activities are currently being addressed by the proponent through negotiation with land owners. Negotiations include the acquisition of land and appropriate compensation for losses incurred as a result of the project. To allow for continued operation of the existing transport networks, the project also involves the provision of supporting infrastructure off lease, including re-routing of local roads and stock routes (refer to section 5.8 for my assessment of transport impacts).

The proponent intends to return the mining lease area to a stable landform capable of supporting similar land uses to pre-disturbance in a manner which is consistent with the rehabilitation hierarchy in DEHP's *Guideline: Rehabilitation Requirements for Mining Projects*[37]. The nominated post-mine land use is a mix of native bushland and low density cattle grazing land.

Rehabilitation and final land use

The proponent has developed a RMP (SEIS Appendix T4.09) as the overarching framework to ensure rehabilitation achieves the nominated post-mine land use. In response to DEHP's comments on the SEIS, the proponent updated its RMP (May 2013) to include more detailed rehabilitation success criteria. DEHP has advised that the updated RMP now provides the requisite level of information on criteria for rehabilitation success. All land disturbed by mining activities would be rehabilitated in accordance with the detailed rehabilitation completion criteria (included as Attachment A of the draft EA conditions (Appendix 1 of this report)).

The rehabilitation schedule and requirements of the RMP would be integrated with the Plan of Operations to ensure that progressive rehabilitation is undertaken in a timely manner. The RMP would be reviewed and updated at least every five years or as required to remain consistent with the Plan of Operations.

The RMP provides a high-level assessment of rehabilitation strategies and requirements for each of the six domains (identified above). Additional detail, which could be implemented at an operational level, would be developed when the first Plan of Operations is prepared to finalise rehabilitation methods and strategies within these domains.

[37] Department of Environment and Heritage Protection, *Guideline: Rehabilitation Requirements for Mining Projects*, Department of Environment and Heritage Protection, Brisbane, 2011.

Figure 5.11 presents the conceptual rehabilitation and final land use plan for the MLA. Table 5.10 presents the final land use and rehabilitation approval schedule. All areas significantly disturbed by mining activities would be rehabilitated in accordance with this schedule.

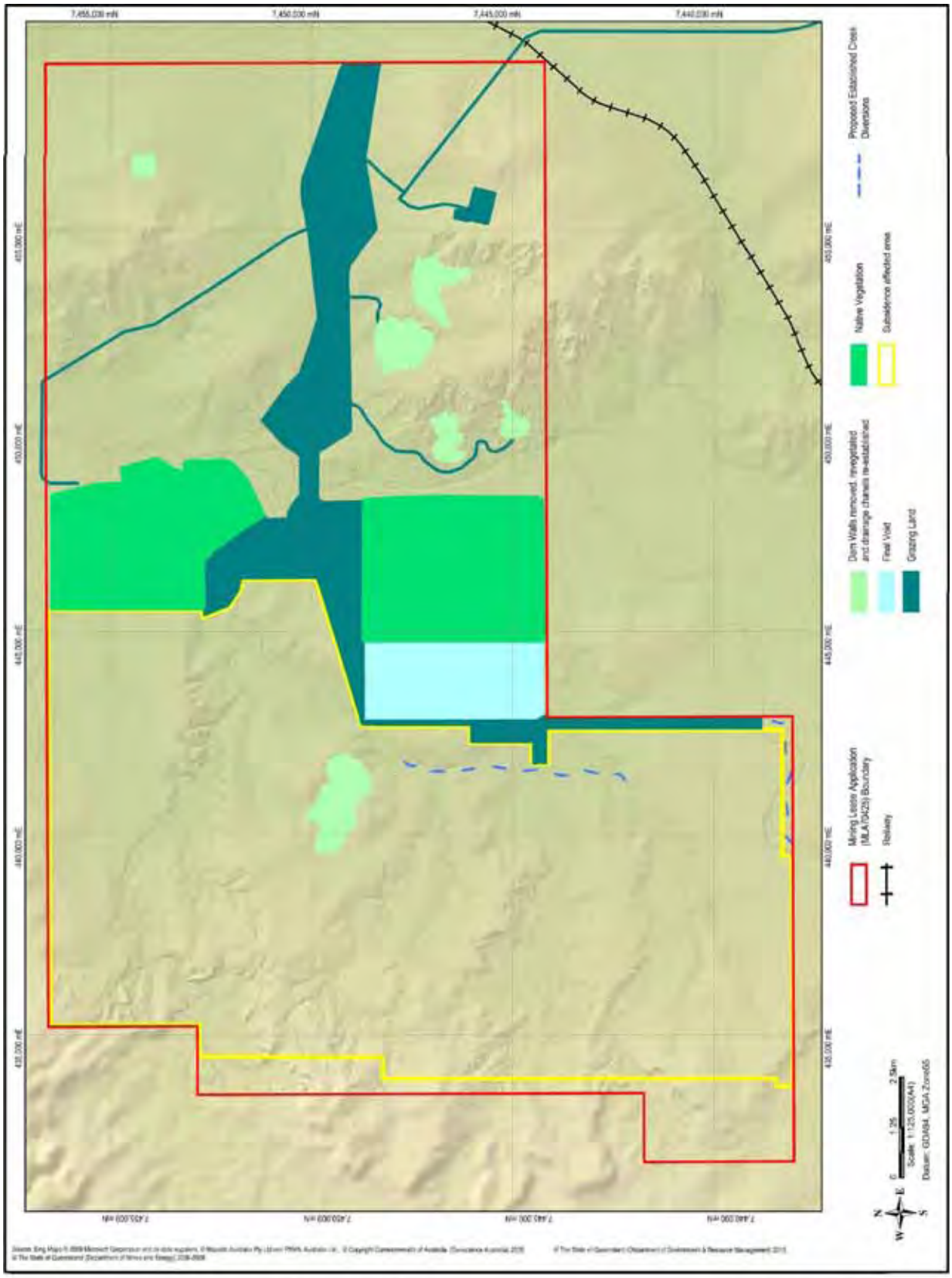


Figure 5.11 Conceptual rehabilitation and final land use plan for the mining lease area

Table 5.10 Final land use and rehabilitation approval schedule

Domain		Approximate surface area (ha)	Pre-mine land use	Post-mine land use	Post-mine land capability classification	Projective cover range (%)	Target slope range (degrees)
1: Infrastructure		2566	Combination of low intensity cattle grazing and bushland	Low intensity cattle grazing	Land Suitability (Low Intensity Grazing). All other areas – Class III1 or IV1.	>70% groundcover is present (or 50% if rocks, logs or other features of cover are present)	No less than 75% of the rehabilitated area has slopes of less than 5 degrees and up to 25% of the rehabilitated area has slopes greater than 5 degrees
2: Pits and Mine waste	Pits	897	Combination of low intensity cattle grazing and bushland	Voids to reach of stable water level over time for storage and stock watering	Voids – Class V1	Not applicable	Void – pits 1 and 2: Final void batter slopes would be designed and excavated to exhibit permanent geotechnical stability. Prior to closure, further investigations would be undertaken to specify design criteria and appropriate action would be taken to ensure effective long term safety, stability and management of the void
	Mine waste	2418	Combination of low intensity cattle grazing and bushland	Combination of low intensity cattle grazing and bushland	Land Suitability (Low Intensity Grazing). All other areas – Class III1 or IV1.	>70% groundcover is present (or 50% if rocks, logs or other features of cover are present)	Borrow Pit and Overburden: No less than 75% of the rehabilitated area has slopes of less than 10 degrees and up to 25% of the rehabilitated area has slopes greater than 10 degrees.

Domain	Approximate surface area (ha)	Pre-mine land use	Post-mine land use	Post-mine land capability classification	Projective cover range (%)	Target slope range (degrees)
3: Tailings Storage Facility	420	Combination of low intensity cattle grazing and bushland	Low intensity cattle grazing	Land Suitability (Low Intensity Grazing). All other areas – Class III1 or IV1.	>70% groundcover is present (or 50% if rocks, logs or other features of cover are present)	Tailings Dam: no less than 75% of the rehabilitated area has slopes of less than 5 degrees and up to 25% of the rehabilitated area has slopes greater than 5 degrees.
4: Dams and surface water features	360	Combination of low intensity cattle grazing and bushland	Low intensity cattle grazing		>70% groundcover is present (or 50% if rocks, logs or other features of cover are present)	As required
5: Subsidence affected SSBV vegetation	632	Combination of low intensity cattle grazing and bushland	Combination of low intensity cattle grazing and bushland		Consistent with existing vegetation as these areas would have minimal disturbance	
6: Other lands	30,087	Combination of low intensity cattle grazing and bushland	Combination of low intensity cattle grazing and bushland		Consistent with existing vegetation as these areas would have minimal disturbance	

Source: Adapted from Tables 3-1 and 3-2 of the Updated Rehabilitation Management Plan (May, 2013)

The progressive rehabilitation of pits, voids and overburden emplacements would be initiated within two years of these areas becoming available. Table 5.11 presents the staged rehabilitation approach as outlined in the Updated RMP (May 2013).

Table 5.11 Progressive rehabilitation throughout the life of the project

Year from commencement of operations	Total area of rehabilitation in progress* or completed (ha)
6	319.5
11	464.2
16	147.3
21	198.9
End of open cut mine life	714.0

* In progress with revegetation commenced but not yet at final completion criteria.
Source: Table 6-2, Updated Rehabilitation Management Plan (May 2013)

Post-disturbance regrading would create slope angles, lengths and shapes compatible with the proposed final land use whilst ensuring a stable landform without high risk of erosion, sedimentation, infiltration or seepage.

An ongoing Rehabilitation Monitoring Program would also be implemented to monitor criteria associated with erosion and soil characteristics, geotechnical stability, surface water and groundwater, creeks and diversions and ecosystem establishment, including ground cover, community structure and composition, habitat, fauna, weeds and pests.

To ensure the safety and stability of voids, the proponent would implement a Void Management Strategy upon mine closure as part of the Mine EMP. This would include mitigation measures to minimise potential impacts associated with the final void, monitoring and final land use. Sampling and analysis programs would also be implemented at the closure of the mine to determine whether a detailed investigation of contamination would be required to determine the extent of remediation if required.

Topsoil management

The handling of soil during the construction and operation of the mine would include activities such as vegetation clearing, topsoil stripping, subsoil removal, stockpiling, re-profiling, tripping and scarification, and soil amelioration.

The EIS identifies a range of usable topsoils for rehabilitation activities within the proposed disturbance areas. The land units and corresponding soil types likely to undergo surface disturbance and be stripped of topsoil are detailed in the Soil and Land Suitability Report (EIS, Appendix I) where volumes have been calculated and classified per disturbance area. There is a high presence of sandy soil throughout the project site, and therefore many soil types are not recommended for stripping, without treatment. However, EIS Appendix I identifies that a total of 16 871 000 m^3 of soil could be stripped for re-use.

The RMP notes that during construction a range of general actions would be implemented to minimise impacts on soil, with the main objective being to return disturbed areas as near as practicable to pre-existing environmental conditions by:

- removing topsoil and stockpiling it separately to the subsoil layer
- maintaining topsoil quantity and quality through the use of sediment fencing, windrowing the topsoil and respreading as soon as practicable after backfilling
- returning the land as far as practicable to the pre-disturbance land use and capability as early as possible
- returning the land to a stable landform (i.e. no subsidence, land slips or major erosion) with no greater management inputs than those required prior to land disturbance.

A Topsoil Management Plan (as outlined in SEIS Appendix T4.13) would be developed to maximise the recovery and re-use of topsoil. The plan would include:

- all relevant aspects for topsoil retrieval such as stripping, stockpiling and re-spreading procedures, stockpile locations and inventory
- topsoil stripping quantities formulated from pre-mining soil survey information
- stripping and stockpile methodology.

Requirements for different post-mining landform elements would be specified in the project's Topsoil Management Plan and Erosion and Sediment Control Plan (SEIS Appendix T4.04). These plans would be implemented as sub-plans of the overarching EMP.

Flora species selection for rehabilitation

Table 4-1 of the RMP provides a summary of species likely to be used for revegetation of the disturbed areas. Native flora species would be used for rehabilitation and, only if unsuccessful, discussions would be held with DEHP regarding the use of introduced species prior to revegetation.

For areas returning to a specific RE, flora species selection would focus on those native species present prior to disturbance and those contained in reference sites of the same RE. For highly modified landscapes such as the tailings dam and overburden emplacement areas (domains 2 and 3), flora species selection would focus on local native species that would successfully establish on the available growth medium, would bind the soil, and would result in a variety of structure and habitat resources.

Section 4.5 of the RMP includes specific Buffel Grass (*Pennisetum ciliare*) management objectives, performance indicators and management actions in order to control and reduce infestations within areas of high value fauna habitat. These include herbicide application, increases in cover litter and re-establishment of mid and upper-story species in areas of native vegetation.

Erosion and sediment control

A site-based Erosion and Sediment Control Plan (SEIS Appendix T4.04) would be implemented as part of the EMP to provide effective erosion control prior to land disturbance activities (refer to section 5.2 of this report for more information). All measures would be installed, kept in place and maintained in a fully functional state until the area has been effectively rehabilitated.

The RMP notes that additional erosion control measures, such as the application of 'hydromulch', would be considered—particularly in drainage lines and steeper batter slopes,

as would opportunities for the use of potential soil ameliorants (biosolids) to accelerate the rehabilitation process.

Subsidence management

The ISMP (SEIS, Appendix N) has been developed as a sub-plan to the Mine EMP to mitigate adverse impacts on watercourses and vegetation as a result of altered topography, surface cracking and ponding of land above underground mining areas. The plan comprises a range of pre-subsidence works to be undertaken in order to reduce the potential for adverse impacts to occur as well as pre-subsidence surveying to enable identification of any impacts that may occur. Post-subsidence mitigation works are also outlined for implementation where subsidence occurs as well as post-subsidence surveying criteria and timeframes. Engineered structures may also be utilised where monitoring indicates their requirement, particularly for creek flow protection.

The plan would be reviewed and updated annually to ensure full effectiveness. Refer to sections 5.2, 5.3 and 8 of this report for an assessment of the impact of subsidence on water resources, terrestrial ecology and MNES (respectively).

Cudmore Resources Reserve

In accordance with the requirements of the NC Act, prior to the commencement of any mining activities occurring in within or below the CRR, the proponent would need to develop an agreed CRR Operations Plan (in consultation with joint trustees DNPRSR and DNRM) to deal specifically with those activities proposed to occur within and beneath the CRR (refer to SEIS Appendix T3 for more information on the structure and proposed table of contents). In particular, the plan would detail management of operations within the CRR to minimise potential impacts on conservation values.

Ten reference sites (six within the CRR and four within the CNP) would be monitored every five years prior to operations, followed by annual monitoring during mining to determine project impacts. This would consist of vegetation and subsidence monitoring in areas of the CRR that are inside the mining lease area and buffers would be implemented to ensure no off-lease subsidence occurs within the CNP.

As identified in the proponent commitments (Appendix 7), any infrastructure required within the reserve would be installed to have minimal impacts on vegetation and any activities requiring vegetation removal must be done in consultation with DNPRSR.

Land contamination

Prior to land disturbance/excavation, soils and possibly groundwater in areas of visual contamination (including those identified in the 2010 field surveys resulting from fuel storage, waste oil storage and minor pesticide and herbicide use) would be investigated by a suitably qualified person (Commitment 8.10, Appendix 7 of this report). Additionally, should soil staining or stock dip structures be encountered during any earthworks, work would be stopped in the area until assessment by a suitably qualified person has been undertaken.

This investigation/assessment would help characterise the potential contamination, ascertain the extent and evaluate any potential risk to site users or the environment. Characterisation

of the potentially impacted soils would allow for assessment of future management and disposal options, in accordance with relevant guidelines.[38]

Potential land contamination resulting from project activities would be managed via general waste and mining waste mitigation measures. General waste measures relevant to the management of fuels, oils and other non-mining wastes are presented within the ISMP (SEIS Appendix T4.01). This plan would be further refined and expanded into a Waste Management Plan for each of the construction, operations and decommissioning phases.

Mining waste mitigation measures would prevent land contamination associated with potential AMD due to the potentially acid forming nature of some overburden/interburden, coarse rejects and tailings. A Mining Waste Management Plan (formerly referred to as the Overburden and CHPP Rejects Management Plan) would be developed in accordance with the requirements of the draft EA conditions (Appendix 1 of this report) and the outline presented in the SEIS, Appendix T4.07.

For further information on the management of general and mining wastes to avoid potential contamination and more specific mitigation measures, refer to section 5.4 of this report (Waste).

5.11.4. Coordinator-General's conclusions

Based on advice from DEHP, I am satisfied that the proponent's updated RMP, a sub-plan of the Mine EMP and the overarching framework for rehabilitation, would ensure all land disturbed by mining activities is effectively rehabilitated to the nominated post-mine land use of a mix of native bushland and low-density cattle grazing land.

In accordance with the EMPs for the project, I also note the proponent would prepare a number of other sub-plans to manage and minimise land disturbance impacts, including but not limited to:

- RMP
- Sediment and Erosion Control Plan
- Topsoil Management Plan
- Pest and Weed Management Plan
- Waste Management Plans (general and mining wastes)
- CRR Operations Plan
- Subsidence Management Plan.

The proponent must implement the EMPs for the project, including all identified sub-plans, in accordance with the requirements of the EP Act (mine tenement) and Appendix 2 this report (off-lease road and rail spur components).

I have also stated a number of draft EA conditions (Appendix 1, Schedule F) which specify requirements regarding rehabilitation, the removal of infrastructure, the deposition of contaminants, and the management of mining waste, subsidence and biodiversity.

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[38] Department of Environment and Resource Management, *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Department of Environment and Heritage Protection, Brisbane, 1998.

In particular, condition F1 (Appendix 1) requires that all land disturbed by mining activities must be rehabilitated in accordance with agreed rehabilitation completion criteria (Appendix 1, Attachment A) and the rehabilitated final landform (Figure 5.11). I have also required that rehabilitation commences progressively as areas become available and in accordance with the Plan of Operations (Appendix 1, Schedule F).

Conditions in Appendix 1, Schedule F also contain provisions for the proper and effective management of subsidence impacts of the 30-year life of the mine. Prior to the commencement of activities that result in subsidence, a final Subsidence Management Plan must be implemented detailing mitigation measures and a program for monitoring and adaptive management. The effectiveness of the plan must be reviewed and reported annually, including recommended actions to ensure actual and potential impacts are effectively managed for the coming year.

Based on the mitigation and management measures outlined in the EMPs for the project, including the updated RMP (May 2013), and the requirements of the draft EA conditions, I am satisfied that land disturbance impacts would be appropriately managed throughout the life of the project.

6. Social and local economic impacts

6.1. Overview

The Kevin's Corner project is located approximately 65 kilometres north-west of the township of Alpha in the BRC area. Alpha has a population of fewer than 400 people[39] and is located 140 km from Barcaldine, the nearest community via key road networks with a population of over 1000 people. Emerald is located 170 km to the east of Alpha and is the closest major centre with over 11 000 people.

A social impact assessment (SIA) was completed in accordance with the TOR for the Kevin's Corner EIS. Matters considered in the SIA included the project's social and cultural area of influence, community engagement, a social baseline study, a workforce profile, potential impacts, and mitigation and management strategies. The social impacts identified are mainly related to local economic change for individuals and communities.

The Alpha Coal Project's proximity to the Kevin's Corner Project has meant many of the stakeholder issues were similar for both projects. A number of the impacts for both projects involve the same stakeholders and partners for the development and implementation of management and mitigation strategies. Refer to Section 3 of this report for details of the consultation undertaken during the EIS process.

The SIA found that the potential negative impacts arising from the project can be effectively managed provided that the right strategies are developed prior to construction. There were no key impacts identified that indicate the project should be delayed, postponed or re-structured due to potential social or local economic issues.

The SIA found that the potential impacts identified for both the local and broader regional study areas were net positive overall including:

- access to the proponent's on-site community services and social infrastructure to complement existing facilities in the area
- direct and indirect local, regional and Indigenous employment opportunities beyond traditional agricultural sector roles
- retention of younger residents through enhanced employment opportunities
- increased revenue and viability for local businesses arising from project-related expenditure.

The subsections below provide more detail on the potential impacts that the SIA identified for enhancement or mitigation; the proponent's strategies to enhance, mitigate and manage the potential impacts arising from the project; along with my analysis, reporting requirements and conclusions.

[39] 2011 preliminary figures from the Office of Economic and Statistical Research (OESR) based on the results of the 2011 Census of Population and Housing.

6.2. Government policy

The Queensland Government has committed to streamlining regulatory and approval processes, including the cost and complexity of the EIS process for coordinated projects, as a means of reducing costs to industry and helping to grow a four-pillar economy. As part of this process, the Coordinator-General is developing a new approach to SIA to assist proponents to effectively identify, assess and propose measures to mitigate the social impacts of coordinated projects. The requirement to complete a social impact assessment as part of the EIS process remains unchanged.

The outcomes of this work will form part of a suite of policies and actions to support the state's strategic direction, reduce red tape, strengthen the resource sector and empower local government, while providing better regional and local outcomes for resource communities. These actions will seek to:

- encourage more effective and adaptive approaches to social impact management
- create greater transparency for communities
- provide greater certainty for proponents
- increase the attractiveness of Queensland to investors
- create a strategic, evidence-based and outcomes-focussed approach to investment in services and infrastructure in resource communities.

I discuss these initiatives in more detail in section 6.5 of this report.

Proponents were previously required to develop a SIMP for major resource development projects requiring an EIS, with associated imposed conditions from the Coordinator-General. As the Kevin's Corner EIS was initiated under these arrangements, the proponent provided a draft SIMP as Appendix D of the SEIS outlining the potential impacts arising from the project and the proponent's responses that have been assessed against the following criteria:

- housing and accommodation
- workforce management
- health and community wellbeing
- community and stakeholder engagement
- local business and industry content

The proposed mitigation strategies remain relevant and have been summarised in Appendix 6.Schedule 2 of this report.

6.3. Project-specific impacts

The local study area identified for the SIA is centred on BRC—particularly the township of Alpha which is the closest permanent settlement to the mine site—and the landholdings surrounding the mining areas. Also included were the coal handling and processing plant, an on-site accommodation village for the rostered workforce, airstrip and light industrial area.

The broader region comprising the Isaac and Central Highlands Regional Council areas was identified as a secondary social and cultural area of influence. Unlike BRC, the Isaac and

Central Highlands areas have experienced recent population growth largely as a result of their longer association with the mining industry.

Smaller townships in the region such as Alpha have struggled to attract and retain permanent residents, and to diversify. This has reduced the likelihood of additional social services and facilities being established in the township, and contributed to ongoing population decline.

Restricted access to essential services (water, sewerage and electricity), limited business activity, and limited access to social infrastructure (schooling and child care) were cited in the SIA as evidence of this cycle in Alpha. Community consultations for both the Alpha and Kevin's Corner SIAs identified isolation and the lack of career opportunities as recruitment barriers for local employers, and highlighted that limited services and schooling opportunities in the region exacerbate this issue.

6.3.1. Social impact assessment

The Kevin's Corner SIA identified and assessed social and economic impacts; defined the roles of the proponent, government, community and other stakeholders; and proposed measures to enhance or mitigate impacts throughout the construction, operation and decommissioning phases of the project.

Appendix B of the SIA provides a summary of the potential impacts, and a ranking for each impact derived from an impact assessment framework. Further analysis of the impacts was then undertaken to reflect the proponent's mitigation and management actions, and to consolidate the impact categories. The impact assessment framework, along with the revised impact categories and their relationship to the original impacts, is outlined in Appendix 6.Schedule 1 of this report.

Potential negative impacts requiring ongoing mitigation, management or monitoring include:

- supply and affordability of housing for purchase and rent
- labour market drain from other sectors into the mining industry
- road safety issues arising from increased usage by heavy vehicles, changing road use protocols and driver fatigue
- heightened anxiety regarding the future direction of the local community and region as a result of mining activity
- interference with Indigenous cultural heritage leading to conflict and a sense of cultural loss
- resident safety and sense of security

The proponent's responses to the potential impacts identified through consultation during and after the EIS process are summarised in Appendix 6.Schedule 2 of this report, based on the criteria that I will use in my assessment.

These actions are supported by a number of plans, procedures and policies that address specific issues or impacts in greater detail including:

- Good Neighbour Policy
- Workforce Code of Conduct
- Local Employment Policy

- Local Industry Participation Plan (based on Queensland Resources and Energy Sector Code of Practice for Local Content 2013)
- Landholder Management Plan
- Road-use Management Plan (RUMP)
- Traffic Management Plan (TMP)
- Community and Stakeholder Engagement Plan
- Fit for Work – Fatigue Management Procedure
- Fit for Work – Drug and Alcohol Procedure.

Further engagement with stakeholders is required to finalise the baseline data, targets and indicators needed to ensure that the actions and supporting documents listed above are completed and implemented prior to the commencement of construction.

The following sections of this report consider the extent to which the actions and supporting documents enhance, avoid, mitigate and manage the impacts of the project.

6.3.2. Housing and accommodation

The availability and affordability of housing are critical issues throughout the broader study region. Large scale projects have the potential to drive up demand in housing markets where supply is limited, resulting in purchase price and rent increases that are beyond the means of households not employed in the mining industry.

Housing market impacts may begin well before construction commences as investors begin to speculate in anticipation of higher rents and capital growth. Employers in other industries can experience difficulties in attracting and retaining key workers as house prices and rents become unaffordable.

The EIS has specifically identified the increased costs of housing for purchase and rental as an impact requiring mitigation. The Department of Communities noted that a proportion of resource workers may choose to live locally for lifestyle and other reasons, and recommended that the proponent consider alternative housing options for these workers to avoid impacts on the local market. Suggested requirements for successful mitigation strategies included:

- accurate information of workforce numbers and profile during various phases of the project.
- frequent liaison with local governments in the region.
- preparedness to collaborate with local government, local housing providers and other companies/proponents as part of a wider housing solution.

The proponent's reliance on a FIFO workforce with on-site accommodation will limit impacts in local and regional housing markets. Additional commitments, including working with BRC to support the provision of infrastructure and serviced land, identifying the housing intentions of new employees, and exploring options for delivering housing in Alpha (if required), will assist in mitigating housing market impacts arising from local employment in the project. The proponent has also committed to contribute to housing market research that identifies vulnerable housing market segments and vulnerable locations in the sub-region and in other parts of Queensland including workforce source communities.

Coordinator-General's conclusions

I expect the proponent to meet the housing and accommodation needs of the project's workforce during the construction and operation phases, while avoiding, managing or mitigating project-related impacts on housing supply and affordability in Alpha and other centres in the BRC area.

I note the proponent's intention to construct sufficient housing on site to accommodate the entire construction and operation workforce, and conclude that this approach should limit local and regional housing impacts. The proponent has also committed to working collaboratively with BRC and other stakeholders to facilitate new residential development, should demand arise in the future.

Speculation over the Alpha and Kevin's Corner projects proceeding has already contributed to increases in the price and availability of land and housing in Alpha. Further impacts on local housing markets could occur if construction or operational workers choose to move into the region for the term of their employment or permanently.

For this reason, I have imposed a condition (Appendix 3.Condition 1) requiring the proponent to provide an annual report to the Coordinator-General from the commencement of construction up to and including the peak construction workforce period and for two years following the commencement of mining operations. The report must describe the actions and adaptable management strategies to avoid, manage or mitigate project-related impacts on local and regional housing markets.

6.3.3. Workforce management

The project has an anticipated construction phase of nine years. The construction workforce is expected to commence with 1000 workers in the first year, rise to an anticipated peak of 1800 workers during the third year, and decline to 250 workers in the final year of the construction phase.

The mine has a projected project life of 30 years or beyond. The operational and maintenance workforce is expected to rise to a peak of 1800 workers in year eight, and remain constant at 1600–1700 workers for the majority of the project's duration. Some downscaling is projected to commence after 25 years of operation. All workforce numbers relate to total workers employed with only half rostered to be on site at any one time.

The small population base and limited workforce experience in the local study area, and the labour demands likely to arise from the Alpha Coal project, present significant challenges for sourcing the Kevin's Corner Project workforce locally. The construction and operational workforces will rely predominantly on FIFO and to a lesser extent BIBO strategies, as the distance between local towns and the Kevin's Corner mine site exceed safe commuting distances.

The construction and operational workforces will be housed in an on-site accommodation village capable of housing the entire project workforce including contract and permanent employees. All construction and operational personnel will be required to stay at the village for the duration of their roster which will operate on a 21-day-on, 7-day-off basis. The preferred location for the village is on the mine lease approximately 10 km from the mining areas, off the site access road and before the Jericho-Degulla Road deviation.

The former Department of Employment, Economic Development and Innovation commented that isolating the mine and workforce from the local community through a FIFO workforce strategy limits the potential for local and regional economic development, and recommended strategies to encourage local employment, local business opportunities and facilitate an ongoing transition towards greater regional economic engagement. Consideration should also be given to developing comprehensive local training options for locally based employees. The proponent has committed to a Local Employment Policy to address these issues.

Coordinator-General's conclusions

I require the proponent to maximise local employment opportunities over the life of the project, including opportunities for local Indigenous people and other disadvantaged groups, and provide training and development opportunities for people locally and regionally to increase their skills and gain employment in the mining sector.

The proponent has committed to a Local Employment Policy, establishing a preferred employment hierarchy prioritising the local area and region, and linking with local and regional training initiatives to improve workforce skills. I also note the commitment to appoint a dedicated Indigenous Liaison Officer to identify direct employment opportunities, and to develop workforce retention and capacity building strategies aimed at supporting increased Indigenous workforce participation.

A number of local training strategies have been identified by the proponent, including a community-based trainee and apprenticeship program; workforce training to backfill project vacancies and minimise the labour drain on other local industries; and industry pathway programs in collaboration with local schools and training providers to enhance local employment opportunities.

These measures represent a satisfactory response to local workforce issues. However, as the workforce requirements of the project will change over time, I have imposed a condition(Appendix 3.Condition 1) requiring the proponent to provide an annual report to the Coordinator-General from the commencement of construction up to and including the peak construction workforce period and for two years following the commencement of mining operations. The report must describe the actions to enhance local employment, training and development opportunities.

6.3.4. Health and community wellbeing

This chapter of the report is concerned with the broader opportunities and impacts for the local community and region arising from the project. For a more detailed assessment of transport issues and cultural heritage issues, including Indigenous and non-Indigenous heritage sites, refer to sections 5.8 and 5.10 of this report.

There is a high degree of social cohesion throughout the broader region, and local residents have indicated that the presence of strong family and social networks within a rural community are the highlights of living in the area. During stakeholder consultation, the local community voiced concerns that large-scale mining activity has the potential to erode this established rural lifestyle. The EIS identified the following impacts for enhancement or mitigation:

- community profile changing from agriculture to include mining
- increased community concern and anxiety because of perceived potential for increased crime and violence with miners
- reduced access and larger distances between properties may break down family and social relations
- increased long-term stability for local and regional communities including Alpha and other centres in the BRC area.

Good access between the isolated townships in the region and larger centres is a critical component of the rural lifestyle that is highly valued by the community, and also provides the basis for greater economic diversification. Residents rely on the local and regional road network for travel, while the Capricorn Highway is a popular tourist route between May and September. The QPS identified the need for strategies to mitigate the impact of construction and operational traffic, including over-dimensional and excess mass vehicles, on public road safety. The EIS identified the following impacts for enhancement or mitigation:

- increased road use and associated safety issues including the potential for accidents arising from driver fatigue
- increased maintenance requirements for the Capricorn Highway, Alpha-Clermont Road and other local roads
- increased traffic acting as a deterrent for tourists
- potentials for spills, releases, fires or explosions causing safety hazards to local and regional communities
- local capacity to respond to emergencies and for volunteer activities may be increased
- improved local access to upgraded roads and telecommunications arising from the project.

The limited availability of services and facilities, including the lack of a permanent doctor and the limited hospital and ambulance services in Alpha, emerged as a key issue during stakeholder consultation and in earlier community surveys undertaken by BRC. The EIS acknowledged that any increase in the local population arising from the project could place additional pressure on existing infrastructure and services, however QH noted that the project is unlikely to have any significant impact on the projected population or health service requirements in Alpha, due to the reliance on a FIFO workforce.

Mining activity has the potential to increase the affluence and life opportunities of individual employees, as wages are generally higher than those in other rural industries. This may support a wider range of services and business in the region, and provide an avenue for local people seeking to transition from industries that are in decline.

However, higher wages may increase income disparity in a community where non-mining wages are relatively low, and place upward pressure on the cost of living. Many centres throughout the region have experienced rapid growth in house prices and rents, as mining workers compete for limited housing stock. The EIS identified the potential positive and negative impacts of an increase in the volume of high mining wages for enhancement and mitigation.

Coordinator-General's conclusions

I expect the proponent to:

- avoid, manage or mitigate project-related impacts on local community services, social infrastructure and community safety and wellbeing
- minimise the impact on emergency services in the region during the life of the project and optimise the safety of the mine and its employees
- facilitate positive interaction between the workforce and local community on and off the project site.

The establishment of mining activity represents a significant change for communities in the local study area. The proponent's reliance on a FIFO workforce, together with the provision of on-site medical and recreational facilities will limit the project's impact on local and regional services and community infrastructure.

The Community Development Fund established for the Alpha Coal Project is also intended to be utilised for the Kevin's Corner Project. The fund will be jointly managed with BRC and will be available to contribute to social infrastructure priorities identified by the community. I note that the proponent has committed to one-off and ongoing contributions from the fund for a range of purposes to address the potential impacts identified in the EIS.

Accident and emergency situations arising from the project, either on- or off-site, may impact on the delivery of emergency services, and compromise the safety and amenity of other road network users. The proponent has committed to collaborating with the relevant state agencies and BRC to develop and implement a:

- RUMP, TMP and Emergency Management and Response Plan to minimise these impacts on the local community
- Memoranda of Understanding (MOU) defining protocols for accessing assistance from mine-leased resources and infrastructure.

Individuals and local communities have the potential to reap the economic benefits associated with the establishment of mining activity. I note, however, that higher wages have the potential to increase the cost of living, and to impact adversely on households not benefiting directly from this activity. Specific commitments that have been made by the proponent to manage the potentially divisive impacts of high-wage employment growth include:

- encouraging employees to undertake volunteering activities within the community
- exploring opportunities for providing financial planning and counselling services to employees and the broader community to reduce the potential negative impacts and enhance the positive impacts associated with increases in wages
- implementing a Regional Capacity Building Program to provide support and skills development for local and regional businesses
- monitoring change in the community associated with higher incomes.

The proponent's actions on local and regional business development also include a commitment to develop a Local Industry Participation Plan as a means of supporting local economic development. I will discuss this in more detail in section 6.3.6 of this report.

I have imposed a condition (Appendix 3.Condition 1) requiring the proponent to provide an annual report to the Coordinator-General from the commencement of construction up to and including the peak construction workforce period and for two years following the commencement of mining operations. The report must describe the actions to avoid, manage or mitigate project-related impacts on local community services, social infrastructure and community safety and wellbeing.

6.3.5. Community and stakeholder engagement

Early consultation activities for both the Kevin's Corner and Alpha Coal projects were combined given the commonality of stakeholders and likely issues. These preliminary activities included community information sessions, meetings with regional councils and targeted consultation with landholders and a range of local organisations and businesses.

The Issac, Central Highlands and Barcaldine Regional Councils are responsible for large and diverse geographic areas that present significant planning and service delivery challenges. Ensuring that large-scale mining projects engage with and reinforce existing local government programs and processes is critical, not only for the success of those projects but for the ongoing sustainability of local communities. The EIS has identified the following impacts for enhancement or mitigation:

- negotiation and uncertainty stresses on affected landholders
- engagement with local and regional planning processes
- development of effective links to local government programs.

Coordinator-General's conclusions

My expectation is that the proponent will:

- engage with the community openly and transparently, ensuring it is informed about the project's impacts and its concerns are considered in reaching decisions
- collaborate with other proponents, local authorities, state agencies and other stakeholders as required to maximise opportunities, address impacts and promote agreed regional outcomes.

I acknowledge the proponent's efforts during the SIA to engage with stakeholder groups, and I consider these efforts sufficient to identify potential impacts arising from the project. The proponent has developed actions and strategies to ensure that stakeholder engagement continues in an effective manner, and to ensure good local and regional access for landholders and the wider community during all phases of the project. These strategies include the Community and Stakeholder Engagement Plan, Good Neighbour Policy and the supporting Landholder Management Plan.

My expectation is that the proponent will implement the Landholder Management Plan and attendant dispute resolution mechanisms during the design phase, and ensure that regular interaction with landholders and other stakeholders occurs throughout the life of the project. The proponent's commitment to establish a dedicated community liaison role to manage relationships in the community, and act as a first point of contact for dispute resolution, is critical in this regard.

I expect the proponent to continue to engage as required with all project stakeholders to complete the actions and supporting documents, and that the baseline data, targets and indicators that will demonstrate the effectiveness of these actions will be made publicly available.

For this reason, I have imposed a condition (Appendix 3.Condition 1) requiring the proponent to provide an annual report to the Coordinator-General from the commencement of construction up to and including the peak construction workforce period and for two years following the commencement of mining operations. The report must describe the actions to inform the community about project impacts and show that community concerns about project impacts have been taken into account when reaching decisions.

6.3.6. Local business and industry content

The BRC area depends heavily on agriculture, and specifically livestock production and slaughtering, as the dominant source of economic activity and employment. This industry has continued to decline in recent years due to decreasing margins and drought, with many young people being forced to seek employment in larger regional centres or on the coast.

The community regards economic diversification, particularly through mining and tourism activities, as essential for the long-term sustainability of the region. While the number of people employed locally in mining has been very small, mining activity is regarded as an avenue for growing local businesses and providing stable employment opportunities to support population growth.

There are concerns that the challenges already faced by businesses in other sectors and local government to attract and retain staff could be amplified by the onset of mining activity. Local employment in mining may also be constrained by a lack of education and training opportunities in the region. The EIS has identified the following impacts for enhancement or mitigation:

- change in occupation and skills drain from other industries with the establishment of mining activity
- increased support, service and supplier opportunities for local businesses
- increased local and regional employment opportunities in a more diverse range of business
- new people bringing skills to the area for non-mining industries
- increase in elementary and high school places due to population growth
- potential for the community to share in mine-specific training.

Coordinator-General’s conclusions

I expect the proponent to be a signatory to the Queensland Resources and Energy Sector Code of Practice for Local Content 2013 and ensure that Queensland suppliers, contractors and manufacturers are given full, fair and reasonable opportunity to tender for project-related business activities.

I note the community’s support for mining and tourism as the basis for economic diversification, along with the challenges that these changes may pose for local communities and businesses including attracting and retaining qualified staff. The project has the potential

to improve access to vocational training for the community, thereby assisting with the retention of school-aged children and young people and I refer to my conclusions in section 6.3.3 regarding the proponent's local training strategies.

6.4. Cumulative impacts

The TOR for the EIS established a requirement for a cumulative impact assessment for a range of issues including social impacts. The proponent's Interim Cumulative Impacts Assessment Report is provided as Appendix O of the SEIS.

The potential cumulative impacts arising from this and other projects were raised by a broad range of stakeholders during all stages of the consultation process. Areas of specific concern included:

- the cumulative impact on health, education and community services in the Central West region
- labour market drain into the mining industry
- housing supply and affordability
- road safety and traffic management impacts
- an increase in social issues such as drug and alcohol misuse and domestic violence.

The Alpha Coal Project report identified the establishment of the Galilee Basin Roundtable as the primary mechanism for identifying and addressing cumulative impacts as multiple projects commence in the region.

The roundtable will include all proponents operating or intending to operate in the Galilee Basin whose project has been declared a 'coordinated project' by the Coordinator General. Membership will evolve as other projects in the region are declared and will also include representatives from State agencies and regional councils.

The roundtable will be tasked with developing short, medium and long term strategies for responding to regional impacts on infrastructure and services that are beyond the scope of individual project assessments. These strategies will be delivered through partnerships between industry, communities, and local governments and State agencies, and will inform and align with regional planning priorities.

6.4.1. Coordinator-General's conclusion

The cumulative impacts arising from multiple projects in the Galilee Basin have the potential to place additional demand on a range of essential services and facilities. The EIS clearly establishes the importance of identifying, assessing, managing and monitoring cumulative impacts.

Cumulative impacts are significant for two main reasons. Firstly, they cannot be fully identified or managed by focusing on the activities of an individual project or development. Secondly, because cumulative impacts result from the activities of multiple projects and proponents, effective management is often only possible through coordination. Maximising the benefits for local and regional communities, and mitigating the negative impacts of this and other projects will require cooperation between proponents, regional councils and state agencies.

While proponents are only responsible for the impacts arising from individual projects, I note the commitment by the proponent of the Kevin's Corner Project to engage with all stakeholders through the Galilee Basin Roundtable to consider cumulative issues and work collaboratively to address all the issues associated with projects and promote good regional outcomes.

6.5. Coordinator-General's overall conclusions

The proponent has addressed the requirements of the TOR for the Kevin's Corner EIS to undertake a SIA. I conclude that the SIA has been completed to a satisfactory standard having regard to the project's social and cultural area of influence, community engagement, a social baseline study, a workforce profile, potential impacts, and mitigation and management strategies.

I note that the proponent has committed to provide the local community with open and transparent engagement mechanisms to discuss matters arising from or related to the construction and operation of the project. This commitment is reflected in the condition that I have imposed on the proponent to report annually to the Coordinator-General on their community engagement actions and strategies during the construction and early operations phase of the project.

The Queensland Government will support economic growth and infrastructure provision across resource communities through its Royalties for the Regions initiative. Royalties for the Regions will help regions hosting major resource developments receive genuine long-term royalty benefits through better planning and targeted infrastructure investment. The program will help resource communities better manage the consequences of resource sector development, seize economic opportunities and encourage growth.

To further assist Queensland regional towns impacted by the mining boom, the Queensland Government has developed the Regional and Resource Towns Action Plan. This plan identifies short-term initiatives and 'on-the-ground' projects to address local issues, such as housing and land availability, affordability and supply blockages, The action plan is based on addressing the issues raised, where possible, and providing local governments with the opportunity to propose other ideas and will be implemented over the next 12 to 24 months.

The mining projects proposed for the Galilee Basin present significant opportunities and challenges for a number of smaller isolated townships, including Alpha. As such, I recommend that as one or more proponents in the region reach financial investment decisions, a process similar to the Regional and Resource Town Action Plan is undertaken for townships such as Alpha.

7. Environmental management plans

7.1. Introduction

This section of the report provides an overview of the EMPs for the project. Post CG Report, EMPs become the key reference documents that convert the undertakings and recommendations made in the EIS and SEIS into actions and commitments to be implemented by the designers, construction operators and subcontractors of the project. The plans specify:

- proposed environmental management strategies, actions and procedures to be implemented to mitigate adverse and enhance beneficial environmental impacts
- monitoring, reporting and auditing requirements
- the entity responsible for implementing proposed actions
- proposed timing
- corrective actions if monitoring indicates that performance requirements have not been met.

Two submissions were made regarding the EMPs in the SEIS comment period. Issues that were raised included:

- updating the EMPs as a result of supplementary studies and information
- ensuring the inclusion of all mitigation measures provided in the EIS documentation.

I have considered these comments and how the proponent has responded to these issues as part of my evaluation of the project.

7.2. Management plans

The proponent has prepared two draft EMPs for the project.

The first has been prepared for project components located within the mining lease area (SEIS, Appendix T1 and subsequently updated in May 2013) in accordance with former section 203 of the EP Act (provision retained under section 683 of the EP Act amended by the *Greentape Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012*). Table 7.1 presents an overview of the structure and content of the mine EMP including relevant sub-plans.

Under the amended EP Act transitional arrangements, a final EMP for the mine site will need to be approved by DEHP before the draft EA can be finalised (former section 207 of the EP Act that was retained by the amending instrument as above)) and released for public objections (section 211 of the EP Act that was retained by the amending instrument as above). Commitments in the mine site EMP may be enforced through the EA conditions. The mine site EMP may be further refined after this report is finalised in consultation with DEHP.

The second EMP has been prepared for those project components that would be located off the mining lease, specifically the construction and operation of the rail spur (2 km off-lease component) and access road (8 km off-lease) (SEIS, Appendix T2 and subsequently updated

in May 2013). Table 7.2 presents an overview of the structure and content of the off-lease EMP, including relevant sub-plans.

The off-lease EMP has been prepared by the proponent as one document to cover rail construction and operation and road construction activities. However, it is possible that the rail and road components would be administered by separate regulatory entities and that the off-lease EMP will need to be re-drafted into separate documents.

Road construction is most likely to be administered by the BRC through a Development Approval under the SPA.

Depending on the State Government's future decision regarding the most appropriate statutory instrument to regulate the private rail line, rail construction and operation could be administered by any of the following entities:

- relevant State Minister—if the land is designated for Community Infrastructure under Chapter 5 of *Sustainable Planning Act 2009*, or
- Barcaldine Regional Council—if a development approval is required under Jericho Shire Planning Scheme for the *Sustainable Planning Act 2009*, or
- the Coordinator-General—if the land is declared under the *State Development and Public Works Organisation Act 1971* to be a State Development Area.

Both EMPs will need to be further refined and expanded after this report is finalised, during the detailed design phase of the project and through ongoing consultation with the relevant regulatory and advisory agencies.

In addition to the mine site and off-lease EMPs, to address specific regulatory issues the proponent has made commitments as outlined in its Proponent Commitment Register, refer to Appendix 7 of this report) to prepare the following additional plans for the project:

- Health and Safety Management System, including sub-plans on fire management, bushfire management, diesel/fuel/oil spill management, dangerous goods and explosives management, vehicle management, high wind management, mine rescue management, flood management and storm response management, security management, pest and mosquito management (*Coal Mining Safety and Health Act 1999*) (refer to section 5.9 of this report for more information)
- Emergency Management and Response Plan (refer to section 5.9 of this report for more information)
- Principal Hazard Management Plans (refer to section 5.9 of this report for more information)
- Species Management Plans in accordance with the requirements of the *Nature Conservation Act 1992* (refer to sections 5.3 and 8 of this report for more information)
- Traffic Management Plan in accordance with DTMR guidelines (refer to section 5.8 of this report for more information)
- Road-use Management Plan (RUMP), including a sub plan on fatigue management, in accordance with DTMR guidelines (refer to section 5.8 of this report for more information)
- Logistics Management Plan (if deemed necessary as a result of the RUMP) (refer to section 5.8 of this report for more information)

- Offset Area Management Plan in accordance with the Queensland Biodiversity Offset Policy 2011 (refer to section 5.3.5 of this report for more information)
- Energy Conservation and Greenhouse Gas Management Plan (refer to section 5.6 of this report for more information).

7.3. Coordinator-General's conclusions

I am satisfied, based on my assessment of the EIS, SEIS and advice from DEHP, that the draft mine EMP has been developed sufficiently for my report to state draft EA conditions for the project (Appendix 1).

I have also stated conditions and recommendations for the construction of the off-lease project components (Appendix 2) based on information provided in the off-lease EMP and advice from DEHP.

I note that the proponent will be required to implement measures contained within its EMPs in accordance with provisions of the EP Act (mine tenement), Appendix 2 of this report (off-lease road and rail spur components) and other legislation referred to in section 7.2 above.

I consider that effective implementation of the draft EMPs and proponent commitments would ensure that environmental impacts of the project could be managed appropriately.

Table 7.1 Overview of mine EMP

EMP Matter	Relevant sub-plan	EIS/SEIS section and status	Relevant draft EA conditions (Appendix 1 of this report)
Air quality and greenhouse gases (refer to sections 5.5 and 5.6 of this report)	Air Quality Management Plan	SEIS Appendix T4.03	Schedule B – Condition B1
	Coal Dust Management Plan	SEIS Appendix T4.03	Schedule B – Condition B1
	Operational Management Plan	To be completed prior to operations and will include requirements for additional dust suppression measures (refer to SEIS Appendix T1, Section T.3.3.7).	Post EA commitments
Water resources (refer to sections 5.1, 5.2 and Appendix 5 of this report)	Groundwater Management Plan	SEIS Appendix T4.05	Schedule C–Conditions C51 to C58
	Surface Water Management Plan	SEIS Appendix T4.11	Schedule C–Conditions C1 to C27
	Mine Water Management Plan	SEIS Appendix T4.12	Schedule C-Conditions C28 to C50
	Interim Subsidence Management Plan	SEIS Appendix N	Schedule F-Conditions F17 to F25 Attachment B: Watercourse Subsidence
	Stream Diversion Monitoring Program	To be completed prior to construction (refer to SEIS Appendix T1, Section T.3.4.8).	Will be conditioned through approval under *Water Act 2000*
	Receiving Environment Monitoring Program	To be completed prior to construction. REMP requirements specified in stated draft EA conditions (Appendix 1 of this report)	Schedule C-Conditions C24 to C27
Noise and vibration (refer to section 5.7 of this report)	Noise & Vibration Management Plan	SEIS Appendix T4.08	Schedule D-Conditions D1 to D3
	Noise, Vibration and Overpressure Monitoring Program	To be completed prior to construction (refer to SEIS Appendix T1, Section T.3.5.6).	Schedule D-Conditions D1 to D3
	Blasting Plan	To be developed by blasting contractor prior to operation	Post EA commitment
Waste management (refer to section 5.4 of this	Interim Waste Management Plan	SEIS Appendix T4.01	Schedule E – Conditions E1 – E8

EMP Matter	Relevant sub-plan	EIS/SEIS section and status	Relevant draft EA conditions (Appendix 1 of this report)
report)	Waste Management Plan (Construction)	To be completed prior to construction (refer to SEIS Appendix T1, Section T.3.6.6).	Schedule E – Conditions E1 – E8
	Waste Management Plan (Operations)	To be completed prior to operations (refer to SEIS, Volume 2, Appendix T1, Section T.3.6.6).	Schedule E – Conditions E1 – E8
	Landfill Design and Environmental Management Plan	This will be an updated version of SEIS Appendix T4.06, in accordance with the former Department of Environment and Resource Management's Guideline *Landfill siting, design, operation and rehabilitation* (revision September 2010) and will be completed prior to construction.	Schedule E – Conditions E1 – E8
	Landfill Operations Plan	To be completed prior to construction in accordance with former Department of Environment and Resource Management's Guideline *Landfill siting, design, operation and rehabilitation* (revision September 2010).	Schedule E-Conditions E1 to E8
	Mining Waste Management Plan	SEIS Appendix T4.07	Schedule F-Conditions F6 to F16
	Sewage Treatment Management Plan	SEIS Appendix T4.10	Schedule H-Conditions H1 to H10
	Overburden Emplacement Facility Operational Plan	To be finalised prior to operations.	Schedule F-Conditions F6 to F16
Land management (refer to section 5.11 of this report)	Erosion & Sediment Control Plan	This will be an updated version of the current SEIS Appendix T4.04 and will be finalised prior to construction.	Schedule C-Conditions C42 to C43
	Topsoil Management Plan	This will be a finalised version of the current SEIS Appendix T 4.13 specific to the operations phase which will be finalised prior to construction.	Attachment A: Rehabilitation Requirements; Table A1: Rehabilitation Completion Criteria

EMP Matter	Relevant sub-plan	EIS/SEIS section and status	Relevant draft EA conditions (Appendix 1 of this report)
	Cudmore Resources Reserve Operation Plan	This will be a finalised version of the current SEIS Appendix T3 specific to the operations phase which will be finalised prior to operations	Will be conditioned through approval under the NC Act
Rehabilitation and decommissioning (refer to section 5.11 of this report)	Rehabilitation Management Plan	SEIS Appendix T4.09 and subsequently updated (current version available on the proponent's website)	Schedule F-Conditions F1 to F2 Attachment A: Rehabilitation Requirements and Figure 11: Rehabilitated Final Landform
	Post Closure Management Plan	To be completed during the operations phase and submitted to the relevant administering authority at least 18 months prior to the final coal processing on site (SEIS Appendix T1, Section T.3.8.9)	Post EA Commitments
	Post Mine Land Use Plan	To be developed and submitted with the initial Plan of Operations and update (SEIS Appendix T1, Section T.3.8.9)	Attachment A: Rehabilitation Requirements; Table A1: Rehabilitation Completion Criteria
	Rail Loop Specific Decommissioning and Rehabilitation Plan	To be developed and implemented closer to the time of decommissioning (refer to SEIS Appendix T1, Section T.3.7.6)	Post EA Commitments
	Void Management Strategy	To be developed at the closure of the mine (SEIS, Appendix T1, Section T.3.8.5)	Post EA Commitments
Terrestrial ecology (refer to section 5.3 of this report)	Pest and Weed Management Plan	SEIS Appendix T4.02	Schedule F-Condition F38
	Kevin's Corner Biodiversity Offsets Plan	SEIS Appendix P and subsequently updated (current version available on the proponent's website)	Schedule F-Conditions F28 to F47
Aquatic ecology and stygofauna (refer to section 5.3 of this report)	There are no specific sub-plans for aquatic ecology and stygofauna. The Environmental values associated with aquatic ecology will be protected through the implementation of the EMPs and sub-plans associated with water resources, rehabilitation and decommissioning and terrestrial ecology. No stygofauna were found on the site.		

Cultural heritage (refer to section 5.10 of this report)	Archaeological Management Plan	To be completed prior to construction (refer to SEIS Appendix T1, Section T.3.11.6).	Not applicable – outside EA
	Cultural Heritage Management Plan	The CHMP is a confidential agreement between the Proponent and the native title claimants and therefore is not included in the EIS documentation.	Separate statutory approval
Environmental Management	Plan of Operations	To be finalised during the construction phase of the project and will include management associated with air quality, waste management, subsidence, rehabilitation, post mine land use, compliance and auditing standards.	Post EA Commitments
	Environmental Management Plan (Construction)	To be finalised prior to construction and will be a refined version of the draft EMP specific to the construction phase.	Post EA Commitments
	Environmental Management Plan (Operations)	To be finalised prior to operations and will be a refined version of the draft EMP specific to the operations phase.	Post EA Commitments
	Staff Training Plan	To be finalised prior to construction (refer to SEIS Appendix T1, Section T.4.6).	Post EA Commitments

Source: Adapted from SEIS, Volume 2, Appendix T1 and mine EMP (May 2013)

Table 7.2 Overview of off-lease EMP

EMP matter	Relevant sub-plan	EIS/SEIS section and status	Relevant conditions (Appendix 2 of this report)
Air quality (refer to section 5.5 of this report)	Air Quality Management Plan 1. Construction 2. Operation	SEIS Appendix T4.03 Updated EMP (T2.3.1 - Air Quality)	• Part A - Condition 2(d)(viii)–dust & air quality (Rail) • Part B - Condition 2(c)(viii)–dust & air quality (Road)
Noise (refer to section 5.7 of this report)	Noise Management Plan 1. Construction 2. Operation	SEIS Appendix T4.08 Updated EMP (T2.3.2 – Noise)	• Part A - Condition 2(d)(x) – noise & vibration (Rail) • Part B - Condition 9(c)(x) – noise & vibration (Road)
Land (refer to sections 5.3, 5.8, 5.10 and 5.11 of this report)	1. Tenure & Tenement Characteristics	Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)(xiii) – agricultural land integrity (Rail)
	2. Protected Areas	Updated EMP (T2.3.3 - Land Use)	
	3. Native Title	Updated EMP (T2.3.3 - Land Use)	
	4. Existing Transport Infrastructure	SEIS Appendix J Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)(xiv) – existing transport & utility infrastructure (Rail) • Part B - Condition 2(c)(xii)– existing transport & utility infrastructure (Road)
	5. Land Uses & Facilities (including sensitive receptors)	Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)(i) – lighting & visual amenity (Rail) • Part A - Condition 2(d)(x) – noise & vibration (Rail) • Part A - Condition 2(d)(viii)–dust & air quality (Rail) • Part A - Condition 2(d)(ix)–coal dust (Rail) • Part B - Condition 2(c)(i) – lighting & visual amenity (Road) • Part B - Condition 2(c)(ix)– noise & vibration (Road) • Part B - Condition 2(c)(viii)–dust & air quality (Road)

EMP matter	Relevant sub-plan	EIS/SEIS section and status	Relevant conditions (Appendix 2 of this report)
	6. Agricultural Values	Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)(xii) – stock routes (Rail) • Part A - Condition 2(d)(xiii)– agricultural land integrity (Rail) • Part B - Condition 2(c)(xi)– stock routes (Road)
	7 Pests & Weeds	SEIS Appendix T4.02 Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)v)– weeds & pests (Rail) • Part B - Condition 2(c)(v)– weeds & pests (Road)
	8. Visual Impacts	Updated EMP (T2.3.3 - Land Use)	• Part A - Condition 2(d)(i)– lighting & visual amenity (Rail) • Part B - Condition 2(c)(i)– lighting & visual amenity (Road)
Soils (refer to section 5.11 of this report)	1. Land Suitability	SEIS Appendix T4.13 Updated EMP (T2.3.4 - Land Use)	• Part A - Condition 2(d)(xiii)– agricultural land integrity (Rail) • Part A - Condition 2(d)(ii)– soils, erosion and sediment control (Rail) • Part A - Condition 2(d)(xv)– rehabilitation of disturbed areas (Rail) • Part A - Condition 2(d)vi)– surface waters (Rail) • Part A - Condition 2(d)(vii)– surface flood waters (Rail) • Part B - Condition 2(c)(ii)– soils, erosion and sediment control (Road) • Part B - Condition 2(c)(xii)– rehabilitation of disturbed areas (Road) • Part B - Condition 2(c)(vi)– surface waters (Road) • Part B - Condition 2(c)(vii)– surface flood waters (Road)

EMP matter	Relevant sub-plan	EIS/SEIS section and status	Relevant conditions (Appendix 2 of this report)
Ecology (refer to section 5.3 of this report)	1. Wildlife Habitat & Vegetation	SEIS Appendix P and subsequently updated (current version available on the proponent's website) Updated EMP (T2.3.5 - Land Use)	• Part A - Condition 2(d)(iii)– native flora and fauna (Rail) • Part A - Condition 2(d)(iv)– fauna passage (Rail) • Part A - Condition 2(d)(xvii)– decommissioning and rehabilitation (Rail) • Part A - Condition 2(d)(v)– weeds & pests (Rail) • Part B - Condition 2(c)(iii)– native flora and fauna (Road) • Part B - Condition 2(c)(iv)– fauna passage (Road) • Part B - Condition 2(c)(xv)– decommissioning and rehabilitation (Road) • Part B - Condition 2(c)(v)– weeds & pests (Road)
	2. Protected Areas	SEIS Appendix P and subsequently updated (current version available on the proponent's website) Updated EMP (T2.3.5 - Land Use)	
	3. Habitat Connectivity	SEIS Appendix P and subsequently updated (current version available on the proponent's website) Updated EMP (T2.3.5 - Land Use)	• Part A - Condition 2(d)(iv)– fauna passage (Rail) • Part B - Condition 2(c)(iv)– fauna passage (Road)

EMP matter	Relevant sub-plan	EIS/SEIS section and status	Relevant conditions (Appendix 2 of this report)
	4. Aquatic Habitat – water crossings	Updated EMP (T2.3.5 - Land Use)	• Part A - Condition 2(d)(iv)– fauna passage (Rail) • Part A - Condition 2(d)(vi)–- surface waters (Rail) • Part A - Condition 2(d)(vii)– surface flood waters (Rail) • Part A - Condition 2(d)(xv)– rehabilitation of disturbed areas (Rail) • Part B - Condition 2(c)(iv)– fauna passage (Road) • Part B - Condition 2(c)(vii)– surface waters (Road) • Part B - Condition 2(c)(vii)– surface flood waters (Road) • Part B - Condition 2(c)(xiii)– rehabilitation of disturbed areas (Road)
Hazard & Risk (refer to section 5.9 of this report)	1. Australian Standards	Updated EMP (T2.3.6 – Hazard & Risk)	• Part A - Condition 2(d)(xviii)– hazard & risk (Rail) • Part B - Condition 2(c)(xvi)– hazard & risk (Road)
	2. Emergency Planning	Updated EMP (T2.3.6 – Hazard & Risk)	• Part A - Condition 2(d)(xviii)– hazard & risk (Rail) • Part B - Condition 2(c)(xvi)– hazard & risk (Road
	3. Legislative Compliance	Updated EMP (T2.3.6 – Hazard & Risk)	• Part A - Condition 2(d)(xviii)– hazard & risk (Rail) • Part B - Condition 2(c)(xvi)– hazard & risk (Road)
	4. Hazard Management	Updated EMP (T2.3.6 – Hazard & Risk)	• Part A - Condition 2(d)(xviii)– hazard & risk (Rail) • Part B - Condition 2(c)(xvi)– hazard & risk (Road)

EMP matter	Relevant sub-plan	EIS/SEIS section and status	Relevant conditions (Appendix 2 of this report)
	5. Training	SEIS Appendix T1, Section T.4.6 Updated EMP (T2.3.6 – Hazard & Risk)	• Part A - Condition 2(d)(xviii)– hazard & risk (Rail) • Part B - Condition 2(c)(xvi)– hazard & risk (Road)

Source: Adapted from SEIS, Volume 2, Appendix T2 and off-lease EMP (May 2013)

8. Matters of national environmental significance

8.1. Introduction

The Australian Government has accredited the State of Queensland's EIS process, conducted under the *State Development Public Works Organisation Act 1971* (Qld) (SDPWO Act), under *An Agreement between the Commonwealth and the State of Queensland relating to Environmental Assessment* (June 2012) (the bilateral agreement). Under the bilateral agreement (made under section 45 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act)), if a controlled action is a declared coordinated project for which an EIS is required under the SDPWO Act, then the project does not require assessment under Part 8 of the EPBC Act. The agreement enables the EIS to meet the impact assessment requirements of both Commonwealth and Queensland legislation.

Under Part 4 of the SDPWO Act and section 36 of the State Development and Public Works Organisation Regulation 1999 (SDPWO Regulation), the Coordinator-General must ensure the assessment report evaluates all relevant impacts that the action has, would have, or is likely to have, and provide enough information about the action and its relevant impacts to allow the Commonwealth Environment Minister to make an informed decision whether or not to approve the action under the EPBC Act.

The controlled action may be considered for approval under section 133 of the EPBC Act, once the Commonwealth Environment Minister has received the Coordinator-General's EIS evaluation report (prepared under section 35 of the SDPWO Act).

This section of the report addresses the requirements of the Queensland Government's assessment as specified by Schedule 1 of the bilateral agreement and Part 5 of the SDPWO Regulation.

8.2. Controlling provisions

On 11 August 2009, the proponent referred the project to the Commonwealth Environment Minister (referral number 2009/5033) for a determination as to whether the project would constitute a 'controlled action'[40] with respect to potential impacts on 'matters of national environmental significance'[41] (MNES) under sections 75 and 87 of the EPBC Act.

The EPBC Act establishes an Australian Government process for assessing environmental impacts and approving proposed actions that are likely to have a significant impact on MNES or on Commonwealth Government land.

On 8 September 2009, the Commonwealth Environment Minister determined that the project is a 'controlled action' under the EPBC Act, and therefore it must be assessed for approval under the EPBC Act. The relevant controlling provisions under the EPBC Act are:

[40] For a definition of 'controlled action', refer to the Glossary on page 442 of this report.
[41] For a definition of 'matters of environmental significance', refer to the Glossary on page 442 of this report.

- sections 18 and 18(A) listed threatened species and ecological communities
- sections 20 and 20(A) migratory species protected under international agreements

8.3. Assessment process

Potential impacts on MNES have been assessed throughout the EIS process for the project. These were reported in:

- EIS: Volume 2, Appendix H: MNES Report
- SEIS: Volume 2, Appendix Q: Supplementary MNES Report.

Both the EIS and SEIS were released for public and advisory agency comment. The Supplementary MNES Report was prepared to specifically address the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) comments on the EIS.

Since the release of the SEIS, the proponent has prepared additional documentation in order to address SEWPaC and/or related Department of Environment and Heritage Protection[42] (DEHP) comments. This includes:

- Biodiversity Offsets Plan to address offset requirements for residual impacts on MNES that could not be avoided or mitigated
- updated environmental management plans (EMPs) to include a consolidated list of mitigation measures identified elsewhere in the EIS and SEIS documentation
- updated Rehabilitation Management Plan (RMP) to include more detailed, measurable and achievable rehabilitation completion criteria and specific measures to suppress and remove buffel grass in areas identified as high-value MNES habitat.

The evaluation of potential impacts on MNES presented in this section of the evaluation report is based on the information contained in the EIS, SEIS and the additional documentation outlined above.

As the listed threatened species and communities of relevance to this project assessment are also protected under State legislation, I have considered advice received from State departments, including the DEHP, as part of my evaluation of potential impacts on MNES.

SEWPaC has been consulted on the evaluation of potential impacts and adequacy of information with respect to MNES during the preparation of this report. In accordance with section 15.5 of the bilateral agreement and section 5(d) of the administrative procedures, SEWPaC has advised that this section of the report provides the required information for the Commonwealth Environment Minister to make an EPBC Act decision.

8.4. Description of the proposed action

HGPL proposes to develop a 30 million tonnes per annum (mtpa) open-cut and underground thermal coal mine in the Galilee Basin. The project includes the development of a 17.8 kilometre rail spur, an airport and associated mining infrastructure.

[42] Formerly the Department of Environment and Resource Management

The project would rely on the railway infrastructure of the Alpha Coal project to transport coal to the Port of Abbot Point, Bowen.

8.4.1. Location

The project is located approximately 65 kilometres north-west of the Alpha township and 110 km south-west of the township of Clermont within the Barcaldine Regional Council (BRC) area (refer to Figure 8.1) in Central Queensland, Australia. It is located on Mining Lease Application (MLA) 70425, which is directly north of the proposed Alpha Coal project tenements (MLA 70426).

The project site is primarily bounded by grazing land with a small section of the Cudmore Resources Reserve (CRR) to the north-west. The nearest residences of adjacent landholders are located approximately 7 km away from the mine site surface infrastructure.

8.4.2. Components

The Kevin's Corner Project would require developments both on and off the 37 380 ha MLA area.

The majority of run-of-mine (ROM) coal would be produced from three individual retreating underground longwall operations (approximately 695 million tonnes) and the remainder from two open-cut pit operations (approximately 184 million tonnes). Overburden would be removed by truck and shovel, excavators and dragline operations and coal would be mined and transported by truck, excavator and conveyors to an on-site coal handling and preparation plant (CHPP), then conveyed to a train load-out facility for haulage.

The following components would be developed on the mining lease:

- **Two open-cut mine areas**—with a combined area of 21 km^2, extending over an initial strike length of 6.5 km reducing to a steady strike length of 4 km.
- **Three underground mine areas**—longwall panels would be approximately 400 m wide, between 3.5 km to 6 km long and an average extraction height of 4.5 m for the Central and Southern mines and 3.5 m for the northern mine. The width of coal left between longwall panels would be between 33.5 m and 46 m. Subsidence of up to a maximum of 2.9 m deep is expected at the surface.
- **Coal handling and preparation facilities**—including sizing facilities for open-cut and underground operations, an overland conveyor system, automated stacking and reclaim facilities, a multi-module CHPP, rail loop and spur.
- **Mine infrastructure area**—site operations control facilities, site vehicle parking, heavy vehicle tyre change facilities, vehicle wash facilities, servicing and maintenance workshops, small stores and first aid facilities.
- **Mine waste and water facilities**—tailings storage facility, overburden emplacements and off-stream water dams.
- **Light industrial area**—workshop, warehouse, storage and welding facilities located along the mine access road adjacent to rail, power and water supplies and the airport. Other mine and support services located in this area would include security, administration, waste management and environmental management facilities.

- **Accommodation village**—suitable for accommodating a workforce of approximately 2000 employees, situated approximately 10 km from the mine.
- **Airport**—a 2.5 km runway to cater for aircraft up to and including an Airbus A320 or Boeing 737 located 8 km east of the project mine infrastructure area.

The following components would be located off the mining lease:

- **rail spur**—2 km (17.8 km including both on- and off-lease components) of rail infrastructure connecting to the proposed Alpha Coal project railway
- **mine access road**—8 km realignment of the Jericho-Degulla Road
- **stock route**—to be realigned where possible with the Jericho-Degulla Road alignment.

The total area of disturbance as a result of the project would be as shown in Table 8.1 and Figure 8.2 below.

Table 8.1 Disturbance areas

Activity	Maximum disturbance area (ha)
Infrastructure, roads and tracks	2566
Pits, voids and overburden emplacements	3315
Tailings storage facility	420
Dams and surface water features	360
Modelled subsidence impact on high-value MNES habitat	476
Modelled subsidence impact on other[43] high-value state-significant biodiversity value habitat	156
Other lands (includes exploration, groundwater monitoring bores and underground mining	30 087
Total	**37 380**

[43] Total modelled subsidence impact to high-value state-significant biodiversity value is 632 ha, which includes 476 ha of high-value MNES habitat.

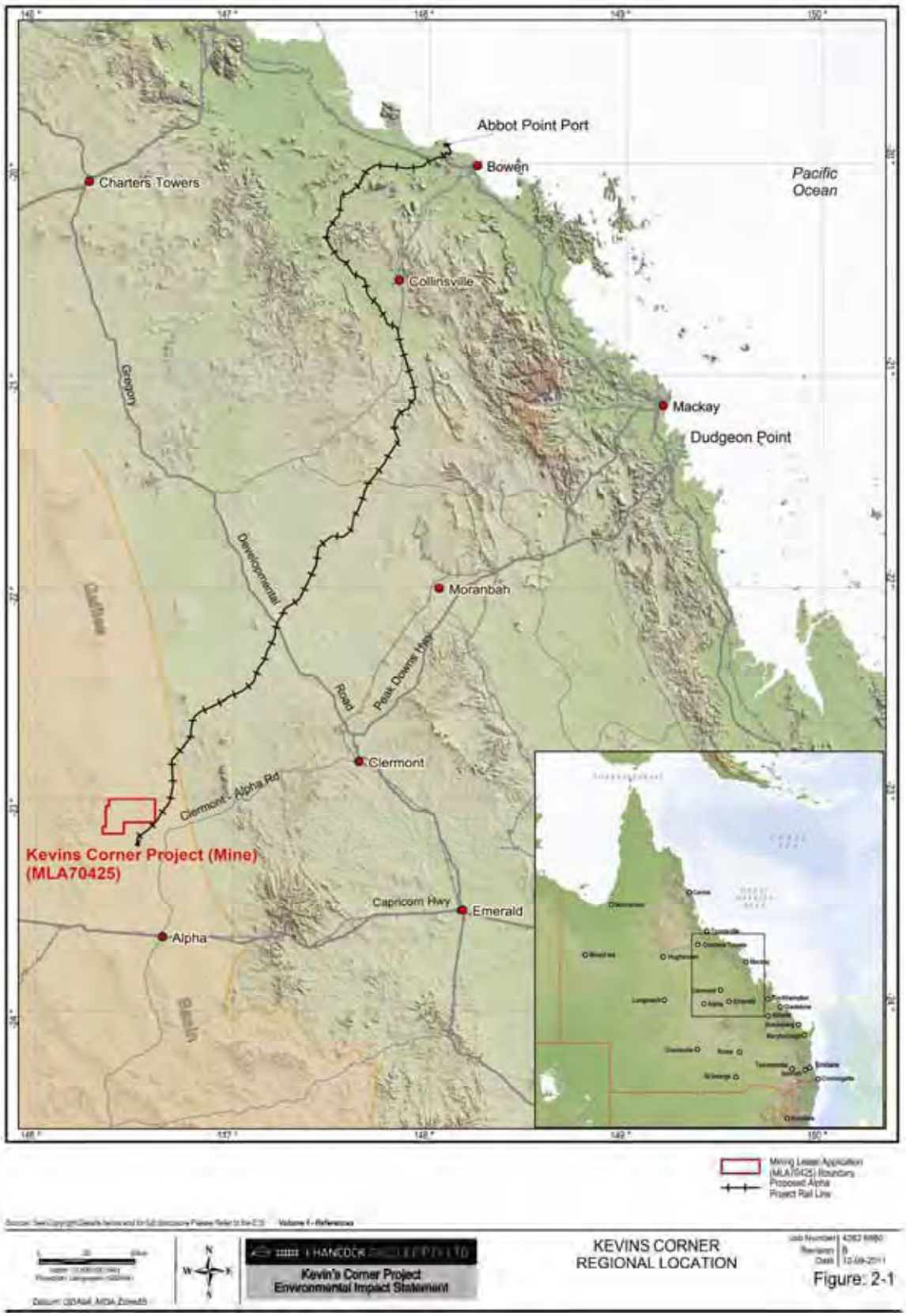


Figure 8.1 Regional location

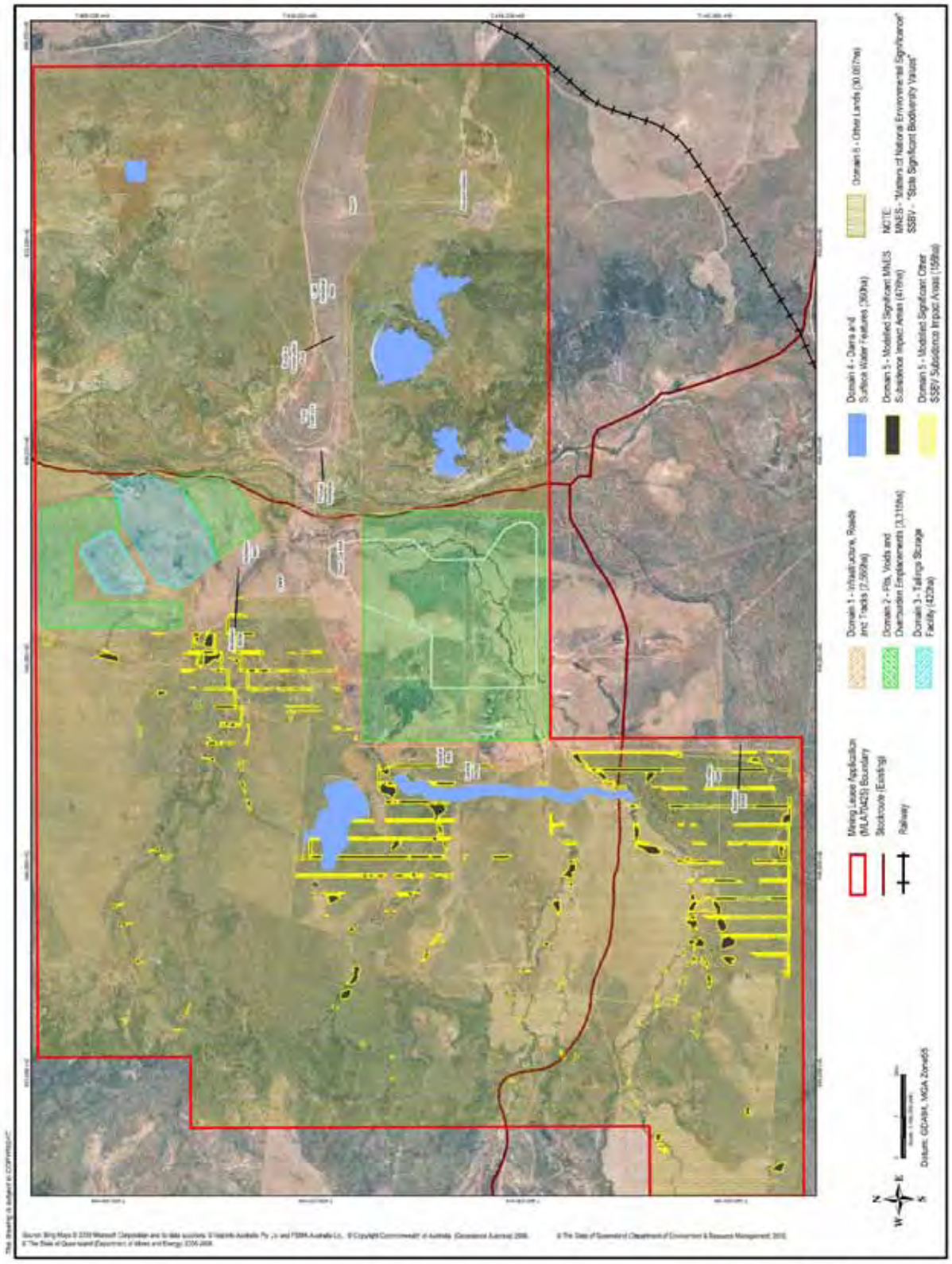


Figure 8.2 Overall site layout domain plan

8.4.3. Development stages

The construction phase for the mine and associated infrastructure is expected to total 48 months, with the bulk of the construction being undertaken in the first 27 months prior to the mining of the first coal.

Infrastructure construction, maintenance, rehabilitation and decommissioning activities would be undertaken throughout the operating life of mine.

The MLA comprises a 40-year lease which includes 30 years of production plus some exploration, pre-construction, construction and decommissioning phases. It is possible that there would be sufficient resources to extend the project life beyond 30 years of production. Any extension of mining activities would be subject to further assessment and approval in the future.

8.4.4. Dependencies and relationships with other projects

The project is dependent on the completion of the following projects which are currently at various stages of receiving environmental and other approvals including the:

- Alpha Coal project—an open-cut coal mine adjoining the southern boundary of the Kevin's Corner mine footprint and a rail line which is proposed to be used by the Kevin's Corner Project to transport product coal to Abbot Point. Together, the two projects would use the proposed 60 mtpa rail line capacity. The Coordinator-General determined the Alpha Coal project could proceed subject to conditions on 24 May 2012. The project received the Federal Environment Minister's approval of the controlled action, subject to conditions, on 23 August 2012.
- Galilee Basin Transmission Project – a high voltage power transmission line proposed by Powerlink which would provide power to the mine site and potentially other Galilee Basin projects via a new 275-kilovolt transmission line from the existing Lilyvale Substation (near Emerald) to a new substation near Alpha.
- Abbot Point Coal Terminal X110 Expansion Project (also know as Terminal 3 (T3))—a new onshore coal terminal where coal from the Kevin's Corner and Alpha Coal projects would be transported prior to being transferred to offshore shipping berths, a project for which Hancock Coal Infrastructure Pty Ltd is the preferred developer. The project received the Federal Environment Minister's approval of the controlled action, subject to conditions, on 10 October 2012.

The impacts of the rail corridor for the transport of coal from both the Kevin's Corner and Alpha Coal mines were considered as part of the Alpha Coal Project.

The Kevin's Corner project is also dependent on the ability of the proponent to acquire access to 120 gigalitres of externally sourced water over the 30-year life of the mine (the subject of separate approvals) from the following two sources:

- purchase of water allocation from the Emerald Fairbairn Dam in association with a dedicated water pipeline
- flood harvesting from the Belyando River.

Projects in the same vicinity as the Kevin's Corner project include the:

- Alpha Coal Project
- Galilee Coal Project—Northern Export Facility (also known as China First), a new 30 mtpa open-cut and underground coal mine adjacent to the Alpha Coal project site (to the south) proposed by Waratah Coal Pty Ltd to supply thermal coal to overseas customers
- South Galilee Coal Project, a new 17 mtpa open-cut and underground coal mine situated south of the town of Alpha proposed by a joint venture between AMCI (Alpha) Pty Ltd (a subsidiary of the AMCI Group) and Alpha Coal Pty Ltd (a subsidiary of Bandanna Energy Limited) to supply thermal coal to overseas customers.

8.5. Assessment methodology

8.5.1. Field surveys

Terrestrial ecology field surveys were undertaken for the EIS between June 2008 and November 2010. Aquatic ecology field surveys were conducted between 16–21 March 2009 and 15–22 March 2010. Field surveys were used to verify the presence and extent of the regional ecosystems[44] (REs), the occurrence of threatened ecological communities (TECs), threatened flora and fauna species listed under the EPBC Act, and potential MNES habitat values in the project area. The proponent considers RE type and status as a reasonable surrogate for biodiversity values and can be used to determine the presence of MNES. For example, known RE associations have been used to help determine the presence of threatened species and TECs listed under the EPBC Act. Details of the terrestrial and aquatic survey methodology are outlined in the EIS (Volume 2, Appendices L1 and L2).

In response to SEWPaC and DEHP comments on the EIS, the proponent conducted an additional terrestrial ecology field survey in August 2012. The survey aimed to: address a shortfall in survey effort across the off-lease portion of the project area; provide greater certainty in relation to the presence of MNES (and species protected under the *Nature Conservation Act 1992* (Qld)); and comply with relevant SEWPaC survey guidelines for reptiles, birds and mammals. The additional survey included:

- access road and rail spur ecological surveys (off-lease)
- targeted surveys for the black-throated finch (*Poephila cincta cincta*)
- targeted surveys for the red goshawk (*Erythrotriorchis radiatus*) combined with general bird surveys
- active searches for reptiles, including the retro slider (Allan's lerista) (*Lerista allanae*)
- habitat assessment (microhabitat features), ground truthing and validation of fauna habitat modelling and validation of absence of habitat for species not expected to occur.

[44] Regional Ecosystems (REs) are a way of describing different vegetation types that relate vegetation, land form and geology.

A total of 63 days of additional field survey was completed, and complementary survey methodologies were adopted where possible to maximise the overall survey effort. The methodology and results of the additional field survey, and conclusions regarding the combined survey effort (2008–2010 and 2012 surveys), are presented in section 5 of the Supplementary MNES Report (SEIS Appendix Q). The location of August 2012 survey sites, vehicle transects and water points used for the black-throated finch survey, are presented in Figure 5.1 of the Supplementary MNES Report.

8.5.2. Likelihood of occurrence

Based on a desktop assessment and combined field surveys of the project site, the Supplementary MNES Report presented a likelihood of occurrence assessment for all MNES that may potentially occur on the project site.

The assessment considered known RE associations for each species or TEC, known records and distribution ranges, and microhabitat requirements such as distance to a permanent water source, patch size and soil types. A description of the REs occurring within the MLA and (off-lease) road and rail corridor is provided within Table 6.3 of the Supplementary MNES Report. The general microhabitat features recorded on site, and the MNES identified as potentially occurring on site which could utilise those features, are presented in Table 6.2 of the Supplementary MNES Report.

The likelihood of occurrence assessment was separated into four categories:

(1) *known to occur*—includes those species or communities which have been recorded on site

(2) *likely to occur*—includes species or communities previously recorded in proximity to the project area, and which have suitable habitat features available on site that may support that species or community

(3) *potentially occurring*—includes those species where suitable habitats or RE associations are present, but where there are no known records in the area

(4) *unlikely to occur*—includes those species for which the site offers limited or no potential habitat, is outside their known range and/or is without broader habitat requirements.

A list of MNES falling within each of these four categories and justification for inclusion is provided in section 6.4 of the Supplementary MNES Report. MNES identified as ‘potentially occurring’ or ‘unlikely to occur’ have not been considered in the proponent’s assessment of potential impacts on MNES. Tables 6.6 and 6.7 of the Supplementary MNES Report provide supporting rationale as to why these species and TECs have been excluded.

Although the black-throated finch (listed as endangered under the EPBC Act) falls within the ‘potentially occurring’ category, this species was included in the proponent’s assessment of potential impacts on MNES due to high-value habitat for the species being identified on the project site (refer to Attachment 2 of the Supplementary MNES Report for more information).

The proponent considers that the level of combined field survey conducted across the entire project area is sufficient to support the decisions made in the Supplementary MNES Report relating to the likelihood of occurrence assessment for each species or TEC.

SEWPaC has identified no issues regarding the likelihood of occurrence assessment presented in the Supplementary MNES Report, with the exception of the Australian painted

snipe (*Rostratula australis*) which has been assessed as 'unlikely to occur'. A response to this issue follows.

Australian painted snipe

SEWPaC considers that suitable habitat may exist on the project site and notes a record to the west of the project in the Diamantina country. The EPBC Act approval conditions for the adjacent Alpha Coal project also accounted for possible impact on the species.

The Australian painted snipe is listed as a vulnerable and migratory species under the EPBC Act, and is listed in the China–Australia Migratory Bird Agreement (CAMBA). SEWPaC's Species Profile and Threats Database identifies that the Australian painted snipe requires suitable wetland areas that possess emergent tussocks of grass, sedges, samphire, rushes or reeds, even in drought conditions. Extensive field surveys of the project site failed to record the species or any suitable wetland habitat. The proponent's bird survey effort, as reported in the Supplementary MNES Report, included:

- 2008–2010: 9 bird surveys at 13 transect sites within the project area in addition to targeted water body searches (Figure 7, EIS Appendix L1 shows the transect sites)
- August 2012: Intensive bird survey focused around 6 watercourses/other permanent water sources, involving two days of monitoring for a minimum of six hours a day at each site (164 hour survey effort).

This survey effort exceeds SEWPaC's threatened bird survey guidelines,[45] which recommend a survey effort of 10 hours over 5 days for the Australian painted snipe. Failure to record the species or any suitable wetland habitat was used in the proponent's assessment that the species is unlikely to occur in the project area.

The species record noted by SEWPaC is located west of Longreach in the Diamantina channel country, which is at least 250 km west of the project site. The region is known to be inundated over hundreds of square kilometres after significant rains occur, providing ideal habitat conditions for the species. Potential impacts on the Australian painted snipe from the Alpha Coal project were associated with the loss of 16.3 ha of potential wetland habitat from the Caley Valley Wetland in order to construct the rail component of the project. The Caley Valley Wetland is located on the coast adjacent to the Abbot Point Coal Terminal, approximately 280 km north-east of the Kevin's Corner project.

Both potential habitat areas associated with the Diamantina channel country and Caley Valley Wetland are located a significant distance from the project site such that they are not considered applicable to this project.

[45] See www.environment.gov.au/epbc/publications/pubs/survey-guidelines-birds.pdf

8.5.3. Habitat modelling and mapped impact areas

Detailed habitat modelling was undertaken for those MNES assessed as being 'known to occur' or 'likely to occur' to determine the extent of potential impacts resulting from the project. Sections 6.5.1 and 6.5.2 of the Supplementary MNES Report outline the methodology for modelling and mapping of high-value potential habitat. With the exception of the black-throated finch, the model used for all MNES species was based on:

- ground-truthed RE mapping for the site
- known records on site from previous surveys
- species-specific habitat criteria based on DEHP essential habitat factors, and where these were not available, broad habitat preferences (for example, RE associations, altitude and proximity to watercourses)
- DEHP Biodiversity Planning Assessments[46] (BPA) Criteria F (Ecosystem Diversity)[47] and G (Context and Connection)[48] for the Brigalow Belt and Desert Uplands bioregions.

BPA Criteria F and G were used to support the identification of high quality habitats and maintain consistency with the habitat mapping methodology applied for the adjacent Alpha Coal project MLA.

These mapping criteria are addressed fully in SEIS Appendix P (Biodiversity Offsets Strategy). A more refined methodology was adopted for the black-throated finch to include more detail on the available habitats obtained during the August 2012 field survey, including verification of the permanency of water resources, remnant vegetation and microhabitat values (refer to section 6.5.3 of the Supplementary MNES Report).

Areas of potential impact resulting from the project (including direct and subsidence impacts) were overlain with modelled high-value habitat to determine the extent of impact upon the habitat of each MNES.

High-value habitat modelling for each individual MNES is contained in Attachment 1 of the Supplementary MNES Report. Mapped impact areas are presented in section 7.4 of the Supplementary MNES Report.

[46] See www.ehp.qld.gov.au/ecosystems/biodiversity/biodiversity_assessment_and_mapping_methodology_bamm.html
[47] BPA Criteria F reflects the degree to which REs are 'packed' within an area. Values are determined according to the number of different ecosystems (richness) and the relative abundance of ecosystems (evenness). A value is determined for each remnant unit (Simpson's Diversity Index) incorporating the number of REs within a remnant and the area of each. This is compared to the maximum index value determined for that bioregion, to determine relative diversity. A high score indicates an area with a high number of REs and ecotones.
[48] BPA Criteria G relates to the extent that a remnant relates or connects to other ecological features in the locality. The proximity to endangered REs and to waterways or wetlands is used to establish the importance of a site for providing buffers to these features and links between features. Connectivity is indicative of the biodiversity and resilience that may be demonstrated by a remnant as well as opportunities it may provide for fauna movement.

8.5.4. Coordinator-General's conclusions—assessment methodology

Based on the proponent's comprehensive survey effort, likelihood of occurrence assessment, detailed high-value potential habitat modelling and mapping of impact areas, I am satisfied that the proponent's assessment methodology adequately allows for the identification and assessment of potential impacts of the project on MNES.

I am also satisfied with the proponent's assessment that the Australian painted snipe is unlikely to occur within the project area on the basis that:

- no suitable habitat exists on the project site
- the species has not been recorded on the project site
- the nearest known sightings are associated with wetland habitat located approximately 250 km away from the project site.

8.6. Independent Expert Scientific Committee for Coal Seam Gas and Large Coal Mining Development advice

Queensland is a signatory to the Council of Australian Governments (COAG) National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development (NPA). The NPA requires coal seam gas or large coal mining development proposals undergoing environmental impact assessment that are likely to have a significant impact on water resources to be referred to the Independent Expert Scientific Committee (IESC).

On 20 December 2012, I submitted to the IESC a joint request for advice (with SEWPaC) for the Kevin's Corner project. The IESC provided final Kevin's Corner project advice on 7 February 2013.

The IESC advice has informed my evaluation of the Kevin's Corner project and is discussed in the relevant sections of this report. A consolidated response to the IESC advice is provided in Appendix 5 of this report.

I consider item 4 and item 10 of the IESC advice to be relevant to the evaluation of the potential impacts of the project on the MNES determined by the Australian Government to be controlling provisions under the EPBC Act (listed threatened species and ecological communities and migratory species protected under international agreements).

Item 4 of the IESC advice relates to potential for connectivity (via faulting in the Rewan Formation) to the Great Artesian Basin (GAB) and consequential impacts on threatened ecological communities reliant on GAB springs. The IESC recommended that the extent of faulting in the Rewan Formation in the local setting should be determined in order to inform the connectivity assessment. The IESC also noted the range of studies underway, such as the GAB Water Resource Assessment, which would provide for better understanding of the level of complexity and connectivity of such systems.

The proponent's site surveys identified no significant faulting or displacement of coal seams that could promote inter-aquifer or inter-basin hydraulic connection. Some minor faults were identified; however these faults have no identifiable connection to the Rewan Formation.

Based on advice from the Queensland Department of Natural Resources and Mines (DNRM) that, on the balance of information available, faulting of the Rewan Formation is not evident in the vicinity of the project, and the proponent's comprehensive assessment of groundwater impacts, I am satisfied that the project is unlikely to impact the GAB aquifers or the threatened ecological communities reliant on GAB springs.

I have included in my review the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) GAB Water Resource Assessment (released on 27 March 2013) and I have not identified any new information relating to the Rewan Formation where it underlies the eastern Galilee Basin that would contradict my conclusions.

As a precautionary approach and based on advice from DNRM, in order to identify any unforseen impacts that may be caused by the mining operations I have made recommendations regarding the monitoring of groundwater levels in the Rewan Formation and Clematis Sandstone (nearest GAB aquifer) and the development of appropriate trigger levels for the early detection of induced flow. More information is provided in section 8.7.3 of this report.

Item 10 of the IESC advice relates to changes to hydrology that may impact vegetation community composition at the site. The IESC considers that changes to inundation regimes may adversely impact MNES (e.g. the black-throated finch and red goshawk) in the area and that further information is required to determine potential impacts from the project.

The Kevin's Corner project and adjacent Alpha Coal project involve a number of creek diversions and flood levels which may result in cumulative flooding impacts. The proponent's cumulative assessment of both projects (SEIS Appendix S) determined that, with the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, there would be no significant change in the area of flooding or duration when compared to the modelled baseline scenario (refer to Figure 8.4 of this report).

Modelling has shown a minor reduction (69 ha) in the area flooded for greater than 96 hours compared to the baseline scenario. However, given the reduction is minor in scale and applies only to major flood events, I do not consider it likely that changes in hydrology would result in adverse impacts on MNES species or habitats beyond the impacts caused directly from the construction of the mine pits and associated infrastructure.

I have stated a number of draft Environmental Authority (EA) conditions to protect surface water values, including conditions to ensure regulated structures (i.e. dams, levees and diversions) can accommodate extreme events. More information is provided in section 8.7.4 of this report.

8.7. Key project impacts

The project comprises various components and operational activities including open cut pits, underground mining and haul roads as described in section 8.4. Each of these components

has the potential to cause a range of direct and indirect impacts on MNES. This section provides a general discussion on the following key impacts on MNES:

- land clearance and habitat loss
- subsidence and related impacts
- impacts on ecological communities dependent on groundwater
- impacts on surface water
- loss of connectivity
- weeds and pests.

A discussion of impacts on individual MNES is presented in sections 8.8, 8.9 and 8.10 of this chapter.

8.7.1. Land clearance and habitat loss

A total of 2834 ha of high-value MNES habitat would be cleared across the project area. This excludes the 476 ha of potential impacts on high-value MNES habitat resulting from predicted subsidence impacts associated underground mining activities. Vegetation clearing would predominantly occur during the first five years of the project as part of site establishment and open cut operations. Minor vegetation clearing would also be required for surface infrastructure supporting underground mining activities. Whilst the proponent has made a commitment to use existing tracks and corridors (cleared of vegetation) for requisite road and infrastructure access (Commitment 9.28, Appendix 7 of this report), clearing may be required to facilitate the installation of ventilation systems for each of the three underground mine workings.

The proponent advises that each ventilation system would have a disturbance footprint of 50 m x 50 m. This disturbance footprint (totalling 0.75 ha) has been accounted for in the proponent's assessment of direct impacts (i.e. vegetation clearing) to MNES. In order to maintain safe ventilation of the mines, each ventilation system would need to be relocated to a second site as mine workings progress to the west. Figure 8.3 identifies the proposed locations for each of three relocated ventilation systems. Each of the proposed locations avoids areas of high value MNES habitat such that no additional disturbance to MNES is anticipated.

Measures to mitigate impacts of vegetation clearance are contained within the draft EMPs (one for the mine tenement and one for the off-lease components) prepared for the project. Measures include (but are not limited to):

- implementing appropriate erosion and sediment controls to prevent sediment deposition in remaining habitat and to maintain the integrity of retained vegetation
- maintaining watercourse buffers based on the widths prescribed in vegetation clearing codes for the Desert Uplands (southern) bioregion[49]
- managing pests and weeds in accordance with the site-specific Pest and Weed Management Plan (SEIS Appendix T4.02)
- undertaking rehabilitation in accordance with the completion criteria identified in the RMP.

[49] http://www.nrm.qld.gov.au/vegetation/pdf/codes/sdu_ongoingcode_250604.pdf

The RMP aims to return a stable landform capable of uses similar to those prior to disturbance (a mix of bushland and low density cattle grazing land). The proposed final land forms and land use aim to link remnant vegetation where possible and return some conservation values. Offsets are proposed for the unavoidable direct clearing of remnant vegetation where it contains MNES values (refer to section 8.12 of this report and the Kevin's Corner Biodiversity Offset Plan (May 2013)).

In response to SEWPaC and DEHP comments on the EIS and SEIS, the proponent has updated its RMP to include more detailed, measurable and achievable rehabilitation completion criteria. I have stated conditions as part of the draft EA for the project to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in the RMP) and rehabilitation must commence progressively as areas become available. Annual reviews of monitoring data must be conducted to assess trends and monitor program effectiveness.

The proponent has also updated its EMPs to ensure both documents contain a consolidated list of mitigation measures identified elsewhere in the EIS and SEIS documentation. The proponent must implement the EMPs for the project in accordance with the *Environmental Protection Act 1994* (Qld) (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

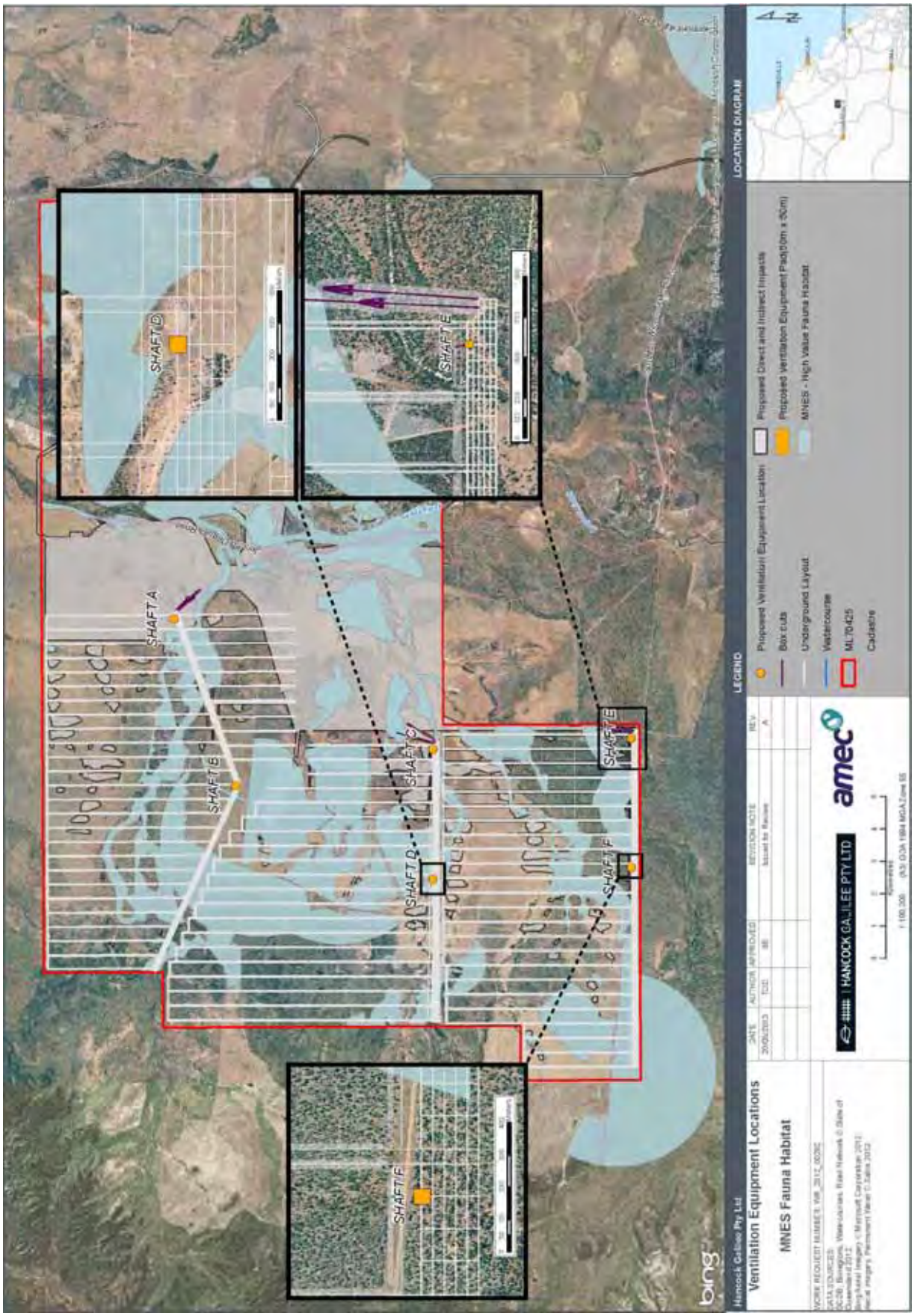


Figure 8.3 Ventilation equipment locations for underground mining operations

Coordinator-General's conclusion

Based on the mitigation measures provided in the proponent's RMP, EMPs and the comprehensive requirements of the EA conditions, I am satisfied that the proponent would minimise impacts on MNES associated with land clearance. I note that measures to offset likely adverse residual impacts on MNES are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013).

8.7.2. Subsidence and related impacts

The Interim Subsidence Management Plan (ISMP – SEIS, Appendix N) presents the results of detailed subsidence modelling and identifies areas of high-value MNES habitat at risk of impact from cracking, ponding and mitigation works (including ripping cracks, pillar excavation and timber groyne construction). This modelling is considered a worst-case assessment as it is based on an overburden composed wholly of rock and does not take into account the quaternary sediments which overlay much of the project area (clay rich with an average thickness of 40 m).

Mapping presented in the Supplementary MNES Report and Offset Plan identifies where impacts on potential MNES habitat may occur from subsidence (refer to Figure 3.2 of the Kevin's Corner Biodiversity Offset Plan, May 2013). Section 7.2.1 of the Supplementary MNES Report provides a detailed discussion on the impacts to potential MNES habitat resulting from subsidence-related ponding, cracking and mitigation measures. A total of 476 ha of high-value MNES habitat is predicted to be impacted from subsidence and related impacts. Subsidence impacts on individual MNES are discussed in Sections 8.8, 8.9 and 8.10 of this chapter.

Mitigation measures focus on minimising the effects of cracking and ponding on watercourses (refer SEIS, Appendix N, section 12). Areas of predicted permanent ponding (considered to be ponds of greater than 1.2 metres that would require more than 6 months to evaporate) would be drained by excavating the pillar structure to allow natural water stream flow. Other mitigation measures include crack infilling, installing erosion control devices, and retaining riparian vegetation to maintain watercourse stability.

All modelled subsidence-related impacts (ponding, cracking and subsidence mitigation works) are proposed to be offset prior to the commencement of mining operations. Accordingly, the project would have offsets in place significantly in advance of the predicted impacts, given some of the underground mine areas would not be developed for 20–30 years.

The management and monitoring of impacts from subsidence would be a long-term proposition, as the impacts of subsidence may not be evident for several years (due to time-lag effects and climatic/seasonal variables) and the proposed 30-year duration of underground mining. Accordingly, I consider that mitigation and restoration activities would need to be adaptive processes as the actual impacts may vary from the predicted impacts and level of success of mitigation measures must also be taken into account.

The ISMP (SEIS, Appendix N, section 12) describes an ongoing adaptive management program of monitoring subsidence impacts and the effectiveness of mitigation measures over the life of the project.

Monitoring would include the establishment of reference sites (not impacted by subsidence and likely to be off-site) matching the REs potentially impacted by subsidence. In order to provide a cross-representation of REs that may be disturbed, permanent monitoring sites would also be established prior to the commencement of underground mining, some of which would be located off site within the CRR and Cudmore National Park (CNP). This would involve bio-condition assessment, photo monitoring and observations of other criteria such as foliar discoloration, increased pathogenic attack, tree death and climatic factors.

As outlined in the ISMP, the proponent would document actual impacts and validate predicted subsidence-related impacts from the modelling in five year stages. Monitoring results would be reported at the end of each five-year period with any proposed changes to management measures.

I have stated conditions for the project's draft EA (Appendix 1, Schedule F) in order to require the proponent's proposed management and monitoring program of subsidence impacts. This includes five-yearly reporting that must:

- assess the area of biodiversity values (including MNES) predicted to be impacted by the underground mining activities for the next five years
- identify the actual areas of biodiversity values impacted by the underground mining activities (based on monitoring results).

Based on the results of monitoring, where the actual area of disturbance is identified as greater than the modelled area of disturbance, I have conditioned (as part of the draft EA) that supplementary biodiversity offsets must be provided (Appendix 1, Schedule F).

Coordinator-General's conclusion

Taking account of the modelled subsidence predictions and mitigation measures provided in the proponent's ISMP, commitments in the draft mine EMP and the comprehensive requirements of the draft EA conditions, I am satisfied that the proponent would minimise impacts on MNES associated with subsidence and related impacts. I note that provisions to offset likely adverse residual impacts on MNES are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013).

8.7.3. Impacts to vegetation communities dependent on groundwater

Impacts of the project on any vegetation communities dependent on groundwater has the potential to impact on MNES, including TECs, threatened flora species, and the habitat of threatened fauna species.

The groundwater assessment prepared for the SEIS (Appendix L) did not identify any groundwater-dependent ecosystems on the project site, and the groundwater piezometeric levels associated with usable aquifers are at depths greater than 20 m and are therefore not accessible to existing vegetation. Groundwater test bore data indicates that there is no hydraulic connection (linkage) between the piezometeric groundwater levels (associated with the underlying confined aquifers) and the ephemeral surface water resources or perched water tables. Therefore the proponent concluded that any reduction in piezometeric pressure, resulting in a decrease in groundwater levels due to mine depressurisation, would not impact on vegetation communities.

The proponent has identified incidents of isolated perched groundwater, during and immediately after the wet season, within the clay-rich alluvium sediments with low permeability and hydraulic gradients, where groundwater has been recorded at depths of 0.5 and 1.5 m below the surface. These perched water tables may provide limited water (low sustainable volumes) for local vegetation communities. There is potential for water to drain from the perched water tables into the mine voids which may impact these vegetation communities. The SEIS predicts that there would be a 10–100 m impact zone directly around the mine void above the perched aquifers. The areas affected coincide with those to be cleared for the provision of infrastructure and access. It is therefore unlikely that any additional areas of vegetation would be impacted as a result of drainage of perched water tables.

The SEIS indicated that riparian vegetation in the project area includes *Eucalyptus spp*. which can have a vertical root depth of up to 10 m. Testing and modelling undertaken as part of the groundwater assessment determined that the riparian communities within the project area are either 'opportunistically dependent on regional groundwater, or without apparent dependence on regional groundwater' (SEIS, Appendix L). Riparian vegetation is therefore considered to have no strong dependence on groundwater and is unlikely to be impacted by changes to groundwater that may occur as a result of the project.

Great Artesian Basin TEC

The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (GAB) TEC is comprised of native plant and animal species that are associated with and dependent on the springs and wetland areas located at points where the Great Artesian Basin groundwater is discharged naturally.

Figure 8.4, a schematic section of the Galilee Basin and GAB based on geological modelling developed for the SEIS (refer to section 4.4.4, SEIS Appendix L), shows that the project mine footprint does not extend far enough west to intercept the closest GAB aquifer (the Clematis Sandstone). Therefore, potential impacts on the GAB TEC may only arise from groundwater draining via geological fault structures from the Clematis Sandstone through the Rewan Formation into the aquifers of the Bandanna Formation and Colinlea Sandstone. This would require a reduction in head in the Colinlea Sandstone significant enough to induce the transfer of water from the Clematis Sandstone through the approximately 175-metre thick Rewan Formation (aquitard).

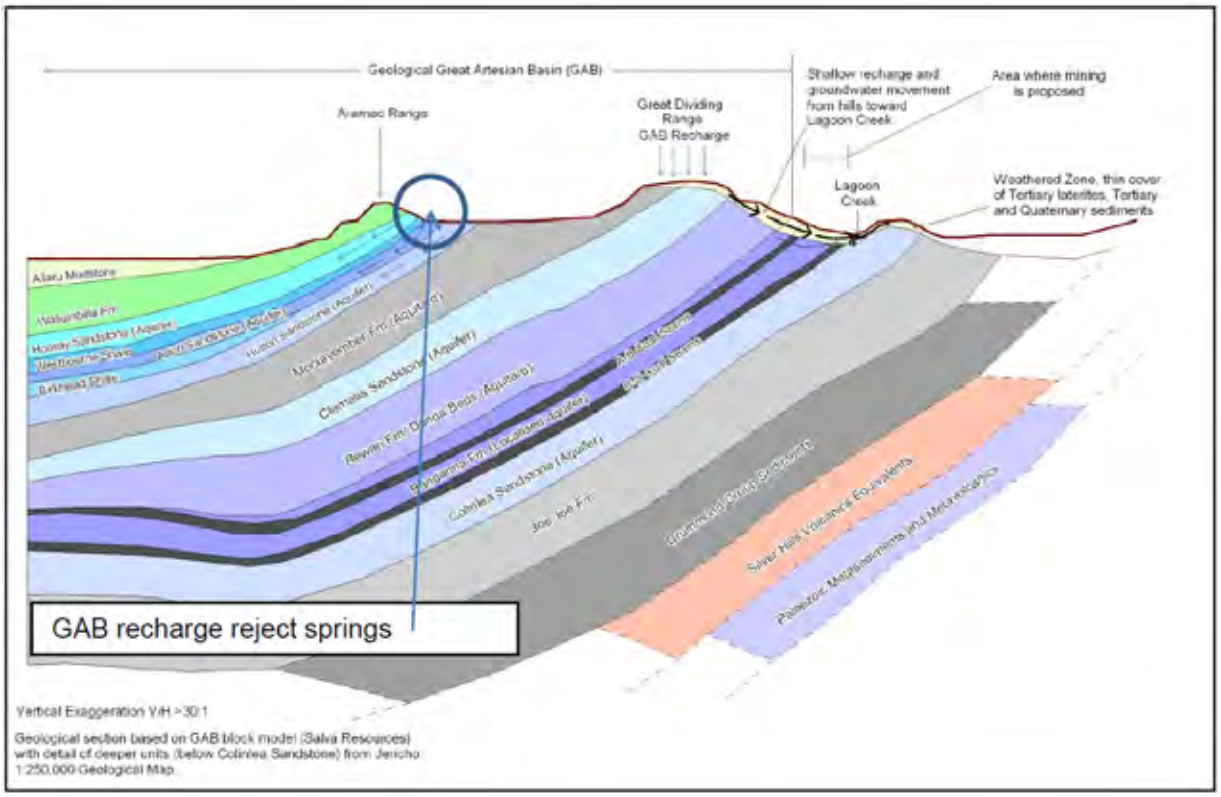


Figure 8.4 Schematic section of the Galilee Basin and GAB

Note: the registered recharge reject springs occur at the Hutton sandstone outcrop, separated from the proposed mining from significant aquitards (Bandanna Formation, Rewan Formation and Moolayember Formation).

No major regional scale fold and fault structures have been mapped crossing or connecting any of the geological units within and adjacent to the MLA area (1:250000 Jericho Geological Map). Furthermore, exploration drilling logs and seismic geophysical surveys of the MLA area did not indicate significant faulting or displacement of coal seams that could promote inter-aquifer or inter-basin hydraulic connection. Some minor faults were identified east of the most easterly outcrop of the Rewan Formation and consequently have no connection to the Rewan Formation. Refer to Appendix 5: Response to IESC advice, for more information regarding localised faulting and GAB connectivity.

Based on the SEIS groundwater modelling results, which predict that the closest GAB aquifer (Clematis Sandstone) would not be impacted by the Kevin's Corner or Alpha Coal projects, and given there is only a possibility of minor fault/s, the Queensland Government Department of Natural Resources and Mines (DNRM) considers that the project is unlikely to impact the GAB aquifers. Accordingly, the project is also unlikely to impact on the GAB TEC.

Great Artesian Basin Water Resource Assessment

The CSIRO's GAB Water Resource Assessment[50] (GABWRA), released on 27 March 2013, involved a basin-scale investigation of water resources and assembled knowledge of geology and hydrology in a consistent way for the whole of the GAB.

The GABWRA provides a reclassification of the GAB hydrostratigraphy by expanding the previously defined 'aquifers' and 'aquitards' into five new graduations ('aquifer', 'partial aquifer', 'leaky aquitards', 'tight aquitards' and 'aquicludes') to provide a better representation in the variability of physical properties associated with geological formations in the GAB.

The GABWRA contains no specific information regarding the Rewan Formation 'aquitard' for the Central Eromanga Region (the relevant region for the Galilee Basin). Notwithstanding this, Figure 3.6 of the report indicates a low potential for hydraulic connection between the basal confining unit of the GAB and the top of underlying basement sequences in the general area between Longreach and the project area. It also indicates negligible potential for hydraulic connection along the eastern margin of the GAB closest to the project area.

Coordinator-General's conclusion

I accept the DNRM's advice that on the balance of information available, faulting of the Rewan Formation is not evident in the vicinity of the project, and that groundwater modelling provided as part of the SEIS (Appendix L: Groundwater Report) adequately provides for the predictive analysis of groundwater impacts arising from both Kevin's Corner and the adjacent Alpha Coal mines over the life of these projects.

Accordingly, I am satisfied that the groundwater assessment provides a comprehensive predictive analysis of potential groundwater impacts, and that mine dewatering and depressurisation required for the project is unlikely to result in impacts to MNES on the project site or to the GAB TEC. I have included in my review the GABWRA and I have not identified any new information relating to the Rewan Formation where it underlies the eastern Galilee Basin that would contradict my conclusions.

I am also satisfied that the project is only likely to result in minor additional on vegetation communities (including TECs, threatened flora and the habitat of threatened fauna species) reliant on perched water table supply, as these vegetation communities coincide with those areas to be cleared for the provision of infrastructure and access. I note that provisions to offset likely adverse residual impacts on MNES are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013).

As a precautionary approach and based on advice from DNRM, in order to identify any unforseen impacts that may be caused by the mining operations I have made recommendations regarding the monitoring of groundwater levels in the Rewan Formation and Clematis Sandstone (Appendix 4, Recommendation 2). I have also recommended that the proponent provide to DNRM an assessment of:

[50] Water resource assessment for the Great Artesian Basin. A report to the Australian Government from the CSIRO Great Artesian Basin Water Resource Assessment. **https://publications.csiro.au/rpr/pub?pid=csiro:EP132685** (accessed 8 April 2013)

- The baseline level (natural groundwater level) in each monitoring bore constructed within the Clematis and Rewan Formations (based on at least 12 months of baseline monitoring data)
- Appropriate trigger levels (lower and upper impact levels) for the early detection of induced flow from GAB aquifers (Appendix 4, Recommendation 3).

Refer to Appendix 5: Response to IESC advice, for more information regarding potential impacts of the project on groundwater resources.

8.7.4. Impacts on surface water

Key surface water impacts resulting from the project which could potentially impact MNES include:

- changes to floodplain inundation and frequency from the project's site water management strategy (flood levee banks and creek diversion—refer to Figure 7-1, SEIS Appendix K), which could alter vegetation community composition and potentially reduce available habitat within the project area
- diminished water quality through, for example, an increase in sediment and erosion or the uncontrolled release of contaminated water. Reduced water quality can impact aquatic fauna and indirectly impact MNES by reducing food sources. Within the project area, migratory wading birds are likely to be the only MNES affected by reduced water quality.

Flooding

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure; hydraulic modelling (SEIS Appendix K: Revised Surface Water Hydraulics Report) predicted that despite an increase in flood levels of up to 1.1 metres during a 1:1000 Annual Exceedance Probability (AEP) flood event, no significant changes to the area of flooding or duration would occur from the construction and operation of the project. This is due to the restriction of the area of flood waters between levees, which would traverse the left bank of Sandy Creek, and the relatively steep natural topography on the right bank of the channel that spans the area of increased water level.

Areas of prolonged inundation (i.e. surface water ponding) are predicted in association with subsidence from proposed underground mining. These impacts, as well as other subsidence-related impacts, have been considered separately under section 8.7.2 of this chapter.

The Kevin's Corner project and adjacent Alpha Coal project involve a number of creek diversions and flood levees which may result in flooding impacts. The cumulative impact assessment of both projects (SEIS, Appendix S) determined that flood levels within the Kevin's Corner mining lease may increase by an additional 90 mm (in addition to the 1.1m increase for the Kevin's Corner project) under a 1:1000 AEP event and result in an equivalent afflux at the upstream (Alpha Coal project) lease boundary. However, flood protection for the Kevin's Corner project has been designed with a one-metre freeboard above the predicted 1:1000 AEP flood level, (of 1.1m). This is considered adequate to prevent inundation of the project site, including completed longwall panels, from a cumulative increase in water levels.

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, a comparison of the cumulative flood

extent with the modelled baseline scenario (refer to Figure 8.5) shows no significant change in the area of flooding or duration. Modelling has shown that with both the Alpha and Kevin's Corner projects in place, there would be a minor reduction (69 ha) in the area flooded for greater than 96 hours compared to the baseline scenario. The reduction in flooding is minor in scale and applies only to major flood events, and is therefore not likely to result in adverse impacts on MNES species or habitats.

Areas along Sandy Creek that are flooded for greater than 96 hours have stayed the same when comparing the baseline scenario and developed (Kevin's Corner and Alpha) scenario. However modelling has shown that there are potentially some very minor additional areas (>10ha) along Little Sandy Creek that would be flooded greater than 96 hours when compared with the baseline scenario. These areas are shown in Figure 8.5 and occur along Little Sandy Creek in proximity to the flood levee and diversion on the western side of the open cut pit area. Some of these areas are cleared and have not been identified as containing MNES values. Other areas further north along Little Sandy Creek are vegetated but have already been identified within the project's direct impact footprint and assessed for their environmental impacts. Therefore there are no additional impacts on MNES to be considered as a result of cumulative flooding.

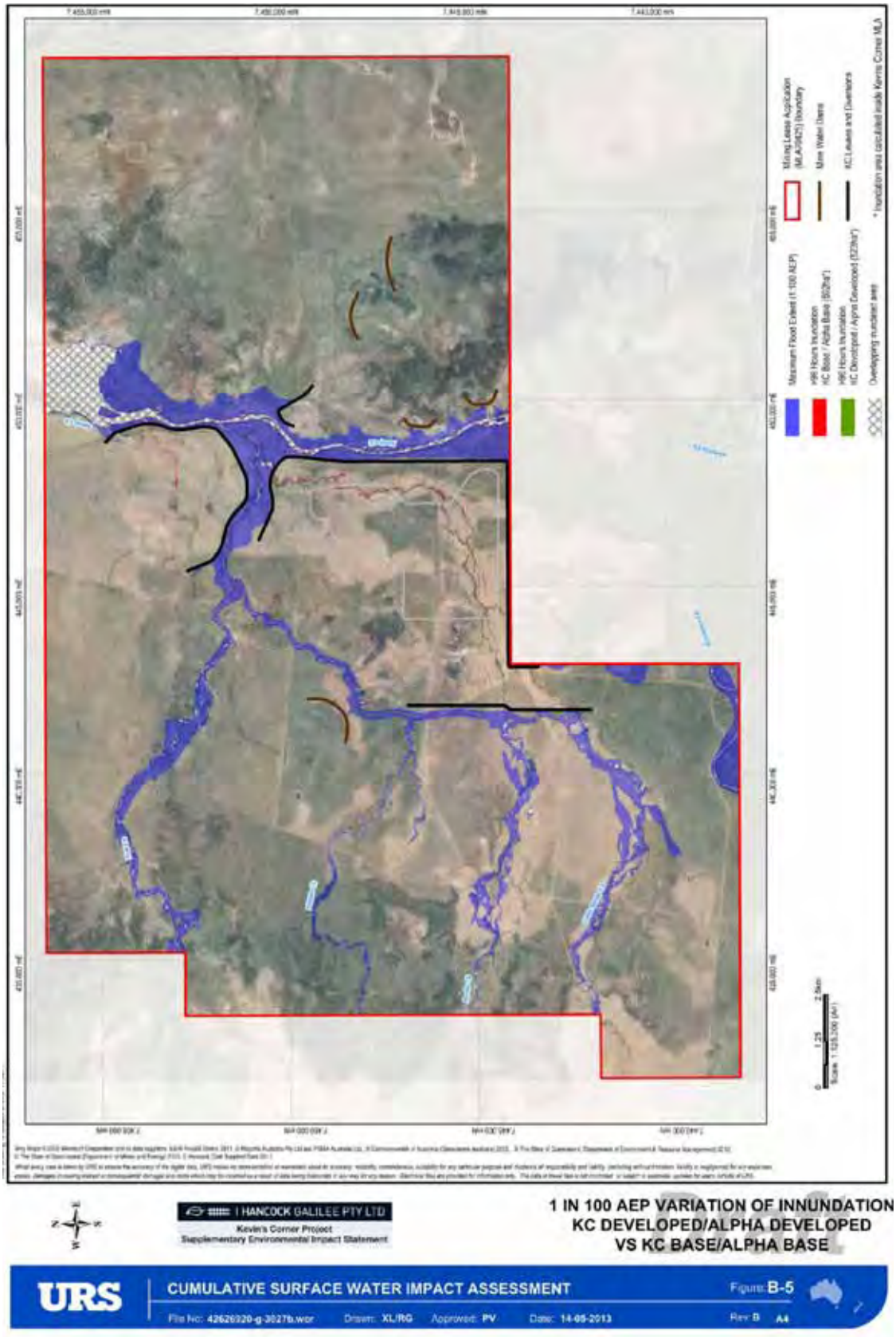


Figure 8.5 Comparison of cumulative flood extent with the modelled baseline scenario

Surface water quality

The quality of water released off-site is dependent on the management of land disturbance during construction, the design, construction and rehabilitation of stream diversions to ensure minimal stream channel erosion and destabilisation, and the management of contaminated water to ensure no uncontrolled or non-compliant releases (e.g. through the design of regulated structures associated with the project's mine water management system). Release of water from the site would be controlled by conditions attached to the project's EA in accordance with the mitigation measures proposed in the mine EMP. Key mitigation measures to reduce impacts on surface waters, as identified in the mine EMP, include:

- adopting best practice erosion and sedimentation controls and pollution control measures across the project area
- designing on-site water storages to have sufficient capacity so that controlled releases (in accordance with draft EA requirements) to the receiving environment would be minimal
- implementing an appropriate mine water management system that would contain mine affected water on site for re-use during coal processing
- retaining riparian vegetation to maintain watercourse stability
- re-profiling drainage paths to stabilise banks and using contour banks, rock armouring, etc. to manage concentrated flows and reduce sediment load increases
- implementing a surface water quality monitoring program in order to assess the impact of the project operations on the receiving environment.

DNRM advises that at this stage of the approval process the proponent's assessment documentation sufficiently addresses the impact of stream diversions and regulated structures required for the Kevin's Corner and Alpha Coal projects on local hydrology and geomorphology. Further information on the detailed design of watercourse diversions and resultant impacts would be provided for both projects as part of future applications for licences required under the *Water Act 2000*.

In particular, the design of any diversion would need to be to current engineering standards and in accordance with the DNRM regional guideline entitled *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry* version 5 (2011).[51] This requires that watercourse diversions replicate geomorphic and riparian vegetation conditions of existing watercourses.

Coordinator-General's conclusion

Based on the proponent's surface water assessment, mitigation measures provided in the proponent's EMPs, comprehensive requirements of the EA conditions and advice received from DNRM, I am satisfied that the proponent would minimise impacts on MNES associated with potential impacts on surface water resources. I note that provisions to offset likely adverse residual impacts on MNES are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013). Impacts on MNES resulting from subsidence and associated impacts, including surface water ponding, are considered in section 8.7.2 of this chapter.

[51] Department of Natural Resources and Mines, *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*, Department of Natural Resources and Mines, 2011.

I have stated a number of draft EA conditions in order to protect surface water values. This includes conditions relating to the detailed design and hydraulic performance requirements to ensure regulated structures (i.e. dams, levees and diversions) can accommodate extreme events (Appendix 1, Schedule G) and requirements to address surface water discharge during extreme weather events (Appendix 1, Schedule C).

In order to address potential cumulative impacts on regional water resources, including potential impacts on existing water users, aquatic habitat loss and impacts on ecological systems, I have also made recommendations to relevant State government departments for the collation of monitoring data and the risk-based assessment of regional cumulative impacts from proposed mining project activities (Appendix 4, Recommendations 7, 8 and 9). Refer to Appendix 5: Response to IESC advice, for more information regarding potential impacts of the project on surface water resources.

8.7.5. Loss of connectivity

Connectivity across the project area has been considered in terms of local habitat connections and broader corridors that sit in a regional context. Within the site, connectivity is linked to riparian corridors of vegetation which run from west to east across the site to connect with the north–south running Lagoon Creek/Sandy Creek riparian corridors. Key areas of connectivity within the project area and identified terrestrial and riparian corridors adjacent to the project are shown in Figure 7.4 of the Supplementary MNES Report.

On the whole, the Supplementary MNES Report considers that connectivity through the project site would be maintained. Watercourses would continue to flow through the site and the majority of riparian vegetation would be maintained. The proposed diversion of Little Sandy Creek would not have a significant impact on local connectivity as this area has been identified as providing minimal habitat value for any identified MNES species. Some sections of impacted riparian vegetation (e.g. from land clearance and subsidence-related impacts) would result in impacts on connectivity. However, by implementing mitigation and revegetation measures, the proponent considers that the majority of these impacts would be short-term.

On a local scale, connectivity would potentially be disturbed by two watercourse crossings to be constructed on Lagoon Creek (west of the stockpile) and on Well Creek (between the northern pit and the CHPP). Riparian vegetation along these watercourses contain habitat for a number of MNES species which may be impacted to varying degrees, depending on mobility and specific habitat requirements. Sections 8.8, 8.9 and 8.10 of this report consider areas of potential habitat fragmentation and impacts on connectivity for individual MNES species and TECs.

Mitigation measures to maintain connectivity, as identified in the mine EMP and updated RMP, include:

- reinstatement and enhancement of disturbed areas in accordance with the final landform proposals to maintain linkages between critical areas of habitat
- rehabilitation of the project area to a mix of bushland and low-density cattle grazing land that would reinstate links between undisturbed areas of remnant native vegetation
- rehabilitation of disturbed areas and the provision of buffers around undisturbed areas of remnant vegetation to minimise habitat fragmentation and edge effects

- a particular focus on riparian vegetation retention and restoration to support a significant proportion of the fauna species habitats and movement corridors through the site
- clearing of riparian vegetation necessary for the project to proceed in a staged manner to allow fauna to migrate to adjacent habitats.

Coordinator-General's conclusion

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have also stated a number of draft EA conditions to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in the RMP) and rehabilitation must commence progressively as areas become available. Annual reviews must be conducted of monitoring data to assess trends and monitor the rehabilitation program effectiveness.

Based on the mitigation measures provided in the proponent's RMP, EMPs and the comprehensive requirements of the EA conditions, I am satisfied that the proponent would minimise impacts on MNES associated with loss of connectivity. I note that provisions to offset likely adverse residual impacts on MNES are outlined in the Kevin's Corner Biodiversity Offset Plan (May 2013).

8.7.6. Weeds and pests

Weeds

A number of pest plants were identified during field surveys. One of the species identified occurs on the list of Weeds of National Significance (WoNS)—Parkinsonia (*Parkinsonia aculeate*). One individual specimen was identified on the rail spur alignment. No other WoNS were identified during surveys. Two additional weed species declared as Class 2 weeds under *the Land Protection (Pest and Stock Route Management) Act 2002* (Qld) (LP Act) were recorded in the project area during surveys—the common pest pear (*Opuntia stricta*) and the velvety tree pear (*Opuntia tomentosa*). Common pest pear was well-established in the project area.

Pests

The following feral animal species were identified within the project area:

- rabbits (*Oryctolagus cuniculus*)
- goats (*Capra hircus*)
- cane toad (*Bufo marinus*)
- cats (*Felis catus*)
- pigs (*Sus scrofa*).

The impacts of these species are likely to include the following:

- predation on native species

- competition for food resources, which may decrease abundance of prey for native predator species
- habitat changes due to destruction of plants; changed floristic composition; reduced regeneration of plants; alteration of soil structure; increased invasion and spread of weeds
- increased access for non-native predator species
- toxicity to native species
- reduced water quality and availability
- spread of exotic invertebrates and creation of habitat suitable for disease, including the spread of root-rot fungus *Phytophthora cinnamomi*.

Mitigation

Weed and pest management is discussed with specific reference to individual MNES where appropriate (refer to the Supplementary MNES Report and sections 8.8, 8.9 and 8.10 of this chapter). The management of weeds and pests within the project area is covered in a Pest and Weed Management Plan (SEIS, Appendix T4.02). Key measures for the management of weeds and pests on the project site include:

- controlling identified weeds of management concern, including declared and environmental weeds, in accordance with local best management practice from the Jericho Shire Pest Management Plan and/or the state government pest fact sheets
- including weed management in the Site Induction Program for the project to promote the awareness of weed management issues
- effectively managing wastes on site—including the landfill (SEIS, Appendix T4.06, Landfill Design and Environmental Management Plan)
- implementing measures to control feral cats, including trapping, fencing and possibly poisoning treatments by licensed contractors, in combination with current land management practices
- implementing measures to control feral pigs, including a combination of physical controls, trapping and/or barrier construction, and possible poisoning treatments by licensed contractors
- implementing measures to control rabbits, by destroying rabbit warrens (via ripping, ploughing, blasting, and fumigating) and possible poisoning treatments by licensed contractors
- implementing measures to control feral goats using mustering, fencing and trapping in conjunction with ongoing land management practices.

Buffel grass (*Cenchrus ciliaris*) was also recorded within the project area, which is a pasture species that can reduce the ecological condition of native vegetation communities and fauna habitat. Although there is currently no specific legislation requiring its control, in response to SEWPaC comments on the SEIS, the proponent updated its RMP to include specific management objectives and performance indicators in order to control and reduce buffel grass infestations within high-value MNES habitats. Management actions include herbicide application, increases in litter cover, and re-establishment of mid- and upper-storey species in areas of native vegetation.

Coordinator-General's conclusion

I note that the proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

Based on the mitigation measures provided in the project's EMPs, including the RMP and Pest and Weed Management Plan, I am satisfied that the proponent would effectively manage weeds and pests in order to ensure the project does not result in unacceptable impacts on MNES.

8.8. Threatened ecological communities

8.8.1. Natural grasslands TEC

Field surveys within the off-lease rail and road corridors confirmed the occurrence of RE 11.8.11 (*Dicanthium sericeum* grassland on Cainozoic igneous rocks), which can form part of the Natural Grasslands TEC.

The listing advice for the Natural Grasslands TEC defines the ecological community as occurring within six subregions of the Brigalow Belt North bioregion. The project area is located in the Upper Belyando Floodout, a subregion which is not identified in the listing advice. Accordingly, the proponent has determined that this RE does not constitute a TEC within the project area and that the Natural Grasslands TEC is unlikely to occur within the project area. SEWPaC concurs with this assessment (refer to section 6.2.1 of the Supplementary MNES Report).

8.8.2. Brigalow TEC

Brigalow TEC (RE 11.3.1) was mapped as potentially occurring within the off-lease rail and road corridors proposed for the project. These areas were ground-truthed during field surveys and were identified as a mixed polygon of REs 11.8.4/11.8.11. Searches of the surrounding area found no RE 11.3.1 to be present. Accordingly, this TEC is considered unlikely to occur within the project area.

8.8.3. Coordinator-General's conclusion—TECs

I have reviewed the EIS and associated documentation, including the Supplementary MNES Report, and I am satisfied with the proponent's assessment that the project would not result in any impacts on TECs listed under the EPBC Act.

8.9. Listed threatened flora

8.9.1. King blue-grass (*Dicanthium queenslandicum*)

There is potential for king blue-grass, listed as vulnerable under the EPBC Act, to occur within a 59-hectare area of potential habitat (RE 11.8.11) located in the off-lease portion of the project in the vicinity of the rail and road corridor.

The off-lease rail and road corridors were targeted during August 2012 supplementary field surveys in an effort to locate specimens of this species, whereby three ecologists walked the length of each corridor. Whilst the species was not identified, the Supplementary MNES Report notes that the field survey was undertaken at a time of the year when no reproductive material was present making the identification of this species difficult. The proponent notes that if the species was assumed to be present, the magnitude of impact would be low and unlikely to be significant when assessed against current SEWPaC guidelines.[52]

Nonetheless, as a precautionary approach, the proponent has committed to offset this 59-hectare area of potential habitat as part of its Kevin's Corner Biodiversity Offset Plan (May 2013) (refer to section 8.12 of this report).

8.9.2. Bloodwood sp. (*Corymbia clandestina*)

This species, listed as a vulnerable species under the EPBC Act, is known from a single HERBRECs record recorded within the Cudmore National Park, which is located to the north-west of, and extends into, the project area.

REs known to support this species have not been mapped within the project area and targeted field surveys failed to identify the species. Unlike king blue-grass, this species is a prominent canopy species which is conspicuous all year round, and as such, seasonal surveys are not required.

Given the failure to record this species and absence of potential habitat, this species is considered unlikely to occur within the project area.

8.9.3. Coordinator-General's conclusion—threatened flora

I have reviewed the EIS and associated documentation, including the Supplementary MNES Report, and conclude that the proponent has adequately assessed the impacts of the project on threatened flora MNES. I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general that would equally apply to threatened flora, as well as proposing additional flora surveys to be undertaken after project approval.

The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

Proponent proposals to offset likely residual impacts are discussed in section 8.12 of this chapter.

8.10. Listed threatened fauna

8.10.1. Squatter pigeon (*Geophaps scripta scripta*)

This species, listed as vulnerable under the EPBC Act, has been observed within the project area. High-value habitat for this species has been modelled and is shown on mapping presented in Attachment 1 of the Supplementary MNES Report.

[52] http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf

A total of 1158 ha of high-value habitat is predicted to be impacted by the project. The habitat impacts map presented in Figure 7.5 of the Supplementary MNES Report indicates that the impact areas are predominantly within the open-cut pits and within areas associated with watercourses located in the western portion of the project area. No high-value habitat was identified within the off-lease rail and road corridors.

The disturbance would largely take place within the first 5 years with an estimated total of 882 ha of high-value habitat to be cleared. Impacts as a result of subsidence and hydrology changes would result in a further 276 ha of high-value habitat being disturbed over the balance of the life of the project.

Table 8.2 summarises the impacts and the proponent's proposed mitigation measures relevant to the squatter pigeon. Proposed mitigation measures are contained within the project EMPs.

Table 8.2 Impacts and mitigation measures relevant to the squatter pigeon

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
1158 ha	• Clearing • Subsidence (high-value habitat affected by cracking, ponding and clearing required for mitigation works). • Feral animals (predation, loss of suitable foraging and nesting sites). • Weed invasion (loss of suitable foraging and nesting sites). • Mortality due to vehicle strike. • Inappropriate fire regime (loss of habitat, animal mortality). • Noise and vibration (unlikely to be a significant impact due to the ability of the species to relocate. • Light (unlikely to be a significant impact due to the ability of the species to easily relocate).	• Fauna spotters would inspect vegetation prior to clearance to determine the location of any squatter pigeon and/or their nests. • Revegetate high-value habitat areas where appropriate with vegetation communities consistent with pre-clearance conditions (SEIS Appendix T4.09 – Rehabilitation Management Plan). • Implement stock management procedures to ensure over grazing does not occur in known areas of high-value habitat (SEIS Appendix T4.09). • Implement subsidence mitigation measures (SEIS Appendix N – Subsidence Management Plan). • Implement pest and weed management measures (SEIS Appendix T4.02 – Pest and Weed Management Plan). • Personnel would be made aware of the presence of this threatened species and the potential for it to be encountered on vehicle tracks. • Implement appropriate fire management procedures. • Implement standard noise mitigation measures (SEIS Appendix T4.08 Noise and Vibration Management Plan). • Implement light spill control measures. • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the squatter pigeon.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.4

The squatter pigeon is a highly mobile species that utilises a range of habitats and it is considered that the project would not have a significant impact on populations of this species in the region. Accordingly, the proponent considers that no offsets are required for this species. However, the proponent notes that the majority of habitat for this species is provided under offsets for other species due to the fact that this species has a broad range of acceptable habitats that it can utilise. In particular, the high-value habitat identified for this species corresponds very closely to that identified for the red goshawk (*Erythrotriorchis radiatus*).

8.10.2. Yakka skink (*Egernia rugosa*) and Brigalow scaly-foot (*Paradelma orientalis*)

The yakka skink and Brigalow scaly-foot are both listed as vulnerable under the EPBC Act. These species utilise common habitats and are subject to similar threats, and are considered together as part of the assessment provided in the Supplementary MNES Report.

High-value habitat for both of these species has been modelled and is shown on mapping presented in Attachment 1 of the Supplementary MNES Report.

A total of 1415 ha of high-value habitat is predicted to be impacted by the project. The habitat impacts map presented in Figure 7.6 of the Supplementary MNES Report indicates that impact areas are predominantly located within the open cut pits, diversions, levee, dams and water storage, accommodation building, landing strip and access and rail loop. A total of 1410 ha of high-value habitat would be removed for these project components within the first five years of construction and open-cut operations.

The main disturbance area runs east-west through the area of high-value habitat located in the eastern portion of the project area. The Draft Referral guidelines for nationally listed Brigalow Belt reptiles (SEWPaC 2011) determined that habitat connectivity between large contiguous areas of remnant vegetation is important for the Brigalow scaly-foot. The loss of more than 6 ha of core habitat—in this case open forests and woodlands in the project area—is considered to be a significant impact. Five hectares of high-value habitat may also be impacted from soil cracking due to subsidence. This habitat is located within the area affected by the worst predicted degree of surface cracking; in the order of 90–180 mm width. Large surface cracks present an entrapment threat for reptiles.

Table 8.3 summarises the impacts and mitigation measures relevant to the yakka skink and Brigalow scaly-foot. Proposed mitigation measures are contained within the project EMPs.

Provisions to offset likely adverse residual impacts for these species are outlined in the Kevin’s Corner Biodiversity Offsets Plan (May 2013) and section 8.12 of this chapter.

Table 8.3 Impacts and mitigation measures relevant to yakka skink and Brigalow scaly-foot within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
1415 ha	• Habitat loss • Habitat degradation Reptiles living along linear infrastructure, such as road side verges, are susceptible to road side maintenance works (slashing, burning, etc.) • Inappropriate fire regime (loss of habitat, animal mortality; increased predation risk). • Weed invasion (loss of suitable habitat; includes the sowing of pasture grasses, within 30 m of important reptile habitat without appropriate and ongoing control measures). • Mortality due to vehicle strike. • Feral animals (predation, loss of suitable habitat). • Creation of surface cracks due to subsidence. • Construction • Lighting—Brigalow scaly-foot populations may be threatened by the introduction of roadside lighting.	• Fauna spotters would inspect vegetation within identified areas of high-value habitat prior to clearance to determine the location of any active colonies or individuals. These would be translocated to suitable adjacent habitat where appropriate. • Maintain habitat connectivity at a landscape scale (for example, along roadside reserves). • Retain microhabitat features in place – retention of woody debris and surface rocks for redistribution to provide habitat. • Establish adequate buffer zones to protect suitable habitats. • Implement measures to exclude cattle from suitable habitats (e.g. gilgai habitats during the wet season) (SEIS, Appendix T4.09). • Develop road and rail corridor management programs that protect reptile habitat features. • Devise and implement water management, sediment erosion and pollution control/ monitoring plans. • Implement appropriate fire management procedures. • Implement pest and weed management measures (SEIS, Appendix T4.02). • Implement pasture and grazing management programs during rehabilitation and continued land use, including exclusion of stock where appropriate. • Notify personnel of the presence of these species and the potential for them to be encountered on vehicle tracks. • Reduce predation opportunities for birds of prey, for example, avoid locating power lines close to suitable reptile habitat. • Devise and implement a habitat management and monitoring plan specific to local reptile species. • Natural repair of small cracks; amelioration with small machinery for wider cracks. • Check construction works within high-value habitat areas as a minimum once every 24 hrs for trapped reptiles. • Adoption of light spill mitigation measures.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.5

8.10.3. Ornamental snake (*Denisonia maculata*)

The ornamental snake is listed as vulnerable under the EPBC Act and occupies riparian habitats located within the project area. The Brigalow Belt reptile Draft Referral guidelines (SEWPaC 2011) indicate that clearing at least 2 ha of important habitat represents a substantial threat to this species. Similarly, alteration of water quality/quantity affecting at least 4 ha of riparian habitat would have a significant impact on the species.

Due to the creek line severance for a bridge construction for the coal conveyor and vehicles, high-value habitat is likely to be impacted. A total of 844 ha of high-value habitat for this species is likely to be lost as a result of the project. As indicated by the habitat impacts map presented in Figure 7.7 of the Supplementary MNES Report, these areas predominantly coincide with the Lagoon/Sandy Creek drainage line as well as a section of Well Creek above the convergence with Sandy Creek. Of the 844 ha, 602 ha would be disturbed in the first five years of construction of the open-cut pit and infrastructure and the residual 242 ha would be disturbed over the remainder of the project.

Table 8.4 summarises the impacts and mitigation specific to the ornamental snake. Proposed mitigation measures are contained within the project EMPs. Provisions to offset likely adverse residual impacts on this species are outlined in the Kevin's Corner Biodiversity Offsets Plan (May 2013) and section 8.12 of this chapter.

Table 8.4 Impacts and mitigation measures relevant to the ornamental snake within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
844 ha	• Habitat loss • Habitat degradation. Reptiles living along linear infrastructure, such as road side verges, are susceptible to road side maintenance works (slashing, burning etc.). • Weed invasion (loss of suitable habitat; including the sowing of pasture grasses, within 30m of important reptile habitat without appropriate and ongoing control measures). • Mortality due to vehicle strike. • Feral animals (predation, loss of suitable habitat) includes contact with the cane toad. The ornamental snake has a diet almost exclusively of various frog species, the species is susceptible to being lethally poisoned by ingesting cane toads, which are abundant within its range. • Creation of surface cracks from subsidence. • Construction • Alteration of water quality through chemical and sediment pollution of wet areas. • Inappropriate fire regime (loss of habitat).	• Maintain habitat connectivity at a landscape scale (for example, along roadside reserves) (updated Rehabilitation Plan). • Retain microhabitat features in place wherever possible, including the retention of woody debris and surface rocks for redistribution to provide habitat (updated Rehabilitation Plan). • Establish adequate buffer zones to protect suitable habitats (updated Rehabilitation Plan). • Implement measures to exclude cattle from suitable habitats. • Develop road and rail corridor management programs that protect reptile habitat features. • Devise and implement water management, sediment erosion and pollution control/monitoring plans (SEIS, Appendix T4.04). • Implement pest and weed management procedures (Pest and Weed Management Plan - SEIS Appendix T4.02). • Implement pasture and grazing management programs during rehabilitation and continued land use, including exclusion of stock where appropriate (updated Rehabilitation Plan). • Make personnel aware of the presence of this species and the potential for them to be encountered on vehicle tracks. • Avoid creating predation opportunities for birds of prey. • Devise and implement a habitat management and monitoring plan specific to local reptile species. • Implement subsidence mitigation and management measures, including the amelioration of wider cracks. • Check construction works within high-value habitat areas as a minimum once every 24 hours for trapped reptiles. • Adhere to water quality management procedures to minimise indirect vegetation loss. • Implement appropriate fire management procedures. • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the ornamental snake

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.6

8.10.4. Black-throated finch (southern) (*Poephila cincta cincta*)

The black-throated finch is listed as Endangered under the EPBC Act. Figure 7.8 in the Supplementary MNES Report provides habitat mapping for the species, which indicates that high-value habitat surrounds four of the permanent water sources within the MLA, predominantly in the west of the project site over underground mining areas. In the south-eastern corner of the MLA, one area of high-value habitat was identified, incorporating the accommodation facility and the main access road. No high-value habitat was found in the access road and rail corridor portion of the project area.

An expected 1000 ha of high-value habitat is likely to be lost as a result of the project, of which 730 ha would be lost initially as part of the open-cut operations and infrastructure and the residual 270 ha would be a consequence of indirect impacts including subsidence.

Table 8.5 summarises the impacts and mitigation specific to the black-throated finch. Proposed mitigation measures are contained within the project's EMPs. Provisions to offset likely adverse residual impacts for this species are outlined in the Kevin's Corner Biodiversity Offsets Plan (May 2013) and section 8.12 of this chapter.

Table 8.5 Impacts and mitigation measures relevant to the black-throated finch within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
1000 ha	• Clearing and fragmentation of foraging habitat. • Reduction in the quality of water. • Alteration in grass species composition or seed availability and inappropriate grazing regimes. • Inappropriate fire regimes. • Introduction of exotic weeds. • Subsidence of habitat.	• Maintain all foraging habitat within 400m of nesting habitat, if detected, and within 3km of water sources. • Fauna spotters would inspect vegetation prior to clearance to determine the location of any black-throated finch and/or their nests and need for translocation. • Revegetate high-value habitat areas where appropriate with vegetation communities consistent with pre-clearance conditions. • Maintain connectivity between important habitat, or areas known or likely to contain the black-throated finch (southern), with corridors of at least 100 m in width where possible. • Build structures (for example buildings, roads etc.) at least 1 km from key water resources and nesting trees. • Enhance the availability of water in the landscape through management and construction of water sources. • Implement stock management procedures to ensure over grazing does not occur in known areas of high-value habitat. • Enhance the availability of seeding grasses in the landscape through the incorporation of conservative stocking rates and wet season spelling into any grazing regime. • Implement appropriate fire management procedures. • Implement pest and weed management procedures (Pest and Weed Management Plan -SEIS Appendix T4.02). • Control and reduction of buffel grass infestations within high-value habitat areas (Rehabilitation Management Plan). • Implement subsidence mitigation and management measures (Subsidence Management Plan – SEIS Appendix N). • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the black-throated finch.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.7

8.10.5. Koala (*Phascolarctos cinereus*)

The koala is listed as vulnerable under the EPBC Act and has been recorded in riparian vegetation within the project area. Both site recordings and habitat modelling indicate that the

high-value habitat of the koala follows the Lagoon Creek/Sandy Creek and Well Creek riparian corridors as well as within the central access crossings and the perimeter of the southern open cut pit. No high-value habitat was identified surrounding the access road and rail corridor areas.

Figure 7.9 of the Supplementary MNES Report shows the high-value habitat impacted as a result of the project. A total of 767 ha of high-value habitat would be affected; 619 ha in the first five years from clearing, and 148 ha occurring over the remainder of the project, including subsidence impacts.

Although the project is not likely to have a significant impact on the region's species population due to the relatively small impacted area, local individuals are still likely to be impacted. Key threats to the koala include loss of suitable feeding trees, stress resulting in illness, vehicle collision and the dissection of riparian vegetation to accommodate bridges and causeways.

Table 8.6 summarises the impacts and mitigation specific to the koala. Proposed mitigation measures are contained within the project's EMPs. Provisions to offset likely adverse residual impacts on this species are outlined in the Kevin's Corner Biodiversity Offsets Plan (May 2013) and section 8.12 of this chapter.

Table 8.6 Impacts and mitigation measures relevant to the koala within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
768 ha	• Loss of feed sources/loss of habitat. • Mortality as a result of vehicle collision. • Disease due to stress. • Subsidence of habitat (ponding, cracking, clearing due to subsidence mitigation measures).	• Include preferred koala feed tree species in areas away from major traffic routes within high-value habitat as part of rehabilitation. • Investigate and implement appropriate fauna movement control devices to minimise the potential for collision. It may be appropriate to combine exclusion fencing with increased lighting at likely crossing points and signage to promote awareness of koala crossings and redirect them to safer crossing locations. • Monitor fauna collision rates to identify high mortality areas with a view to incorporating additional protective measures where appropriate. • Replace habitat in accordance with rehabilitation requirements. • Implement subsidence mitigation and management measures (Subsidence Management Plan – SEIS Appendix N). • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the koala.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.8

8.10.6. Red goshawk (*Erythrotriorchis radiatus*)

The red goshawk is listed as vulnerable under the EPBC Act and is considered likely to occupy riparian vegetation across the project area. Impacted habitats as a result of the project are limited to those which require clearing for access, the rail loop and the open-cut pits. Impacted high-value habitat has been modelled and can be identified in Figure 7.10 of the Supplementary MNES Report. High-value habitat areas coincide with the Lagoon Creek/Sandy Creek corridor as well as remnant vegetation within the southern open-cut mine. A total of 1201 ha of high-value habitat would be lost as a result of the project—917 ha in the first five years and a further 284 ha over the remainder of the project by indirect impacts associated with subsidence.

Table 8.7 summarises the impacts and mitigation specific to the red goshawk. Proposed mitigation measures are contained within the project's EMPs. Provisions to offset likely adverse residual impacts on this species are outlined in the Kevin's Corner Biodiversity Offsets Plan (May 2013) and section 8.12 of this chapter.

Table 8.7 Impacts and mitigation measures relevant to the red goshawk within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
1201 ha	• Habitat loss through land clearance. • Altered fire regimes. • Impacts associated with feral animals. • Subsidence of habitat.	• Retain riparian zone vegetation wherever possible. • Minimise habitat disturbance within range of pairs if detected. • Monitor known sites if detected and develop appropriate management protocol with landholders. • Implement appropriate fire management procedures. • Implement pest and weed management procedures (Pest and Weed Management Plan - SEIS Appendix T4.02). • Implement subsidence mitigation and management procedures (Subsidence Management Plan - SEIS Appendix N). • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the red goshawk.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.9

8.10.7. Coordinator-General's conclusion—threatened fauna

I have reviewed the EIS and associated documentation, including the Supplementary MNES Report, and conclude that the proponent has adequately assessed the impacts of the project on threatened fauna MNES. I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general that would equally apply to threatened fauna. The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

I have also stated conditions to be applied to the construction and operation of the mine (Appendix 1) and off lease project components (Appendix 2) to mandate the proponent's commitments that should minimise the impacts on threatened fauna. However, given the scale of the proposed mining operation there would be residual adverse impacts. Proponent proposals to offset these impacts are discussed in section 8.12 of this chapter.

8.11. Migratory species

8.11.1. Eastern great egret (*Ardea modesta*) and cattle egret (*Ardea ibis*)

Both the eastern great egret and the cattle egret are listed as migratory under the EPBC Act. The eastern great egret was recorded within the project area and the cattle egret is considered likely to occur. These species utilise similar habitat and experience similar threats and have therefore been grouped together for the purposes of assessment. The SEIS identifies high-value habitat for these species to be predominantly limited to riparian areas surrounding the Lagoon Creek/Sandy Creek system and Well Creek in addition to lower-order southern water courses.

The SEIS considers that the project is unlikely to result in significant impacts to critical habitat areas. No rookeries were identified and there is limited capacity to support them given the lack of wetlands present within the project site. Accordingly, the lifecycles of the species are not likely to be impacted. Nevertheless, habitat would still be impacted. Figure 7.11 in the Supplementary MNES Report shows the high-value habitat which would be impacted by the project—a total of 762 ha. Of this figure, 619 ha would be potentially impacted in the first five years, which would include those areas within the central access roads connecting to open-cut pits and into the southern pit. The residual 143 ha that would be potentially impacted are within the diversion levee and areas impacted by subsidence.

Considering the migratory nature of the species, the SEIS considers it likely that they would be occasional visitors rather than a population being dependent on the project area. In addition to this, due to the wide distribution of the species, the populations present on the project site are not considered to be an ecologically significant proportion of the total population. Consequently, mitigation measures reflect the likelihood of occurrence of both species. Impacts and mitigation specific to the eastern great egret and cattle egret are presented in Table 8.8. Proposed mitigation measures are contained within the project EMPs.

Although offsets are not proposed for these particular species, offset requirements for other species, such as the koala, would provide habitat for the eastern great egret and cattle egret due to similar habitat requirements. Further information can be found in the Kevin’s Corner Biodiversity Offsets Plan (May 2013).

Table 8.8 Impacts and mitigation measures relevant to the eastern great egret and cattle egret within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
762 ha	• Loss and/or degradation of foraging and breeding habitat due to: – alteration of water flows – drainage and/or clearing of wetlands – frequent burning – invasion by exotic plants. • Predation by feral cats. • Subsidence of habitat.	• Retain riparian zone vegetation where possible. • Incorporate riparian structure and composition in to rehabilitation where possible. • Adhere to water quality management procedures to minimise indirect vegetation loss. • Implement appropriate fire management procedures. • Implement pest and weed management procedures (Pest and Weed Management Plan - SEIS Appendix T4.02). • Implement subsidence mitigation and management procedures (Subsidence Management Plan, SEIS Appendix N). • Implement an approved Species Management Plan that would include detailed mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the Eastern Great Egret and Cattle Egret.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.10

8.11.2. Rainbow bee-eater (*Merops ornatus*)

The rainbow bee-eater is listed as migratory under the EPBC Act and was recorded on the project site during terrestrial ecology surveys. This species occupies a broad range of habitat and, therefore, all REs and non-remnant areas can potentially provide foraging habitat. High-value habitat for the rainbow bee-eater surrounds watercourses in the project area which can be seen in Figure 7.12 of the Supplementary MNES Report. Impacted areas of high-value habitat predominantly surround the central access and infrastructure areas, open-cut pits and smaller areas associated with the diversion levee and longwall panels (subsidence impacts).

A total of 344 ha of high-value habitat would be lost as a result of the project. However, the majority of suitable habitat would remain unaffected.

Considering the migratory nature of the species, it is likely that it would be an occasional visitor rather than being dependent on the project area. In addition to this, due to the wide distribution of the species, the populations present on the project site are not considered to be an ecologically significant proportion of the total population. Consequently, mitigation measures reflect the likelihood of the species' occurrence. Table 8.9 summarises the impacts and mitigation measures relevant to the rainbow bee-eater. Proposed mitigation measures are contained within the project EMPs.

No offsets are proposed for the rainbow bee-eater; however, high-value habitat for this species coincides with habitat identified for the koala and ornamental snake and would therefore have habitat provided through the offsets for these species. Further information on offsets can be found in the Kevin's Corner Biodiversity Offsets Plan (May 2013).

Table 8.9 Impacts and mitigation measures relevant to the rainbow bee-eater within the project area

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
344 ha	• Habitat destruction due to clearing. • Predation by feral animals—rainbow bee-eater is susceptible to predation by cane toad.	• Rehabilitate native vegetation where possible. • Adhere to water quality management procedures to minimise indirect vegetation loss. • Implement appropriate fire management procedures. • Implement pest and weed management procedures (Pest and Weed Management Plan - SEIS Appendix T4.02). • Implement an approved Species Management Plan that would include comprehensive mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the rainbow bee-eater.

Source: Adapted from SEIS, Volume 2, Appendix Q, Table 7.11

8.11.3. Fork-tailed swift (*Apus pacificus*)

The fork-tailed swift is listed as migratory under the EPBC Act and is considered likely to occur. The species occupies a broad range of habitats and therefore potentially utilises all REs and non-remnant areas as foraging resources. The fork-tailed swift is predominantly aerial in its behaviour, and uses a large range of foraging resources. Given this species does not breed in Australia, no high-value habitat has been mapped within the project area.

The project is not expected to substantially impact on the species due to the wide range and low value of potential habitat on site.

Nevertheless, as a precautionary measure, mitigation measures have been proposed that are relevant to the fork-tailed swift—a summary is presented in Table 8.10. All proposed mitigation measures are contained within the project EMPs.

Table 8.10 Impacts and mitigation measures relevant to the fork-tailed swift

Predicted maximum disturbance to high-value habitat	Potential impacts	Mitigation measures
0 ha	• Habitat destruction due to clearing. • Predation by feral animals—fork -tailed swift is susceptible to predation by cane toad.	• Rehabilitate native vegetation where possible. • Adhere to water quality management procedures to minimise indirect vegetation loss. • Implement appropriate fire management procedures. • Implement pest and weed management procedures (Pest and Weed Management Plan – SEIS Appendix T4.02). • Implement an approved Species Management Plan that would include comprehensive mitigation, monitoring and reporting requirements and performance criteria in order to avoid and/or mitigate impacts on the fork-tailed swift.

Source: SEIS, Volume 2, Appendix Q, Table 7.12

8.11.4. Coordinator-General's conclusion—migratory species

I have reviewed the EIS and associated documentation, including the Supplementary MNES Report, and conclude that the proponent has adequately assessed the impacts of the project on migratory species listed under the EPBC Act. I note the proponent has made a number of commitments to avoid and mitigate impacts on vegetation in general that would apply equally to migratory species. The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components).

8.12. Offsets

In May 2013, the proponent finalised the Kevin's Corner Biodiversity Offsets Plan. The offsets plan aims to address both State and Australian Government offset requirements based on up-to-date policies in March 2013. The offsets plan responds to comments received on the Biodiversity Offsets Strategy prepared as part of the SEIS (Appendix P), including: an updated offset assessment under the new EPBC Act *Environmental Offset Policy* (October 2012) and accompanying *Offsets Assessment Guide*; and information on potential offset sites in accordance with the Queensland Government's Galilee Basin Offset Strategy (GBOS).

The proponent is proposing to offset up-front all predicted residual direct (vegetation clearing associated with project infrastructure) and indirect (residual impacts as a result of underground mining and subsidence) impacts on MNES for the life of the project. This would ensure that the proponent is always in credit as suitable offset sites would be in place within a short period of time post project commencement, even though a proportion of impacts would not be experienced until at least 15–20 years post project commencement.

The extent of high-value habitat required to be offset for the life of the project for MNES is identified in Table 8.11. The Brigalow scaly-foot and yakka skink have the largest offset requirement under the EPBC Act with 1415 ha of high-value habitat being impacted for both fauna species.

Table 8.11 Offsets required under the EPBC Act[53]

Offset value	Impact area to be offset (ha)
Black-throated finch (southern) (*Poephila cincta cincta*)	1000
Ornamental snake (*Denisonia maculata*)	844
Brigalow scaly-foot (*Paradelma orientalis*)	1415
Koala (*Phascolarctos cinereus*)	767
Red goshawk (*Erythrotriorchis radiatus*)	1201
Yakka skink (Egernia rugosa)	1415
King blue-grass (*Dichanthium queenslandicum*)	59

The Kevin's Corner Biodiversity Offsets Plan provides a tailored assessment for each of the seven MNES proposed to be offset, and an assessment of a proposed offset site for its suitability for that particular species. Habitats were determined through desktop modelling based on RE associations and habitat features for each species that are consistent with the habitat modelling prepared for the impact sites.

Results show that the preferred offset site is likely to contain suitable habitats for all MNES fauna species required to be offset, and in sufficient area. As a result of assessing the proposed offset areas for each MNES species through the EPBC Act Offset Assessment Guide, it was determined that the total offset area required to meet all of the MNES fauna species requirements is 5300 ha.

The majority of the proposed offset area (5300 ha) is located within the conservation hubs identified in the Queensland Government GBOS. Conversation hubs are pre-identified properties confirmed as containing high conservation values, provide the best biodiversity benefits in the region and are located where mining interests are limited.

One MNES flora species, king blue-grass, is proposed to be offset on a second offset site with a total offset area of 260 ha. This offset site has been confirmed as containing suitable natural grassland habitat for the species during previous field surveys in August 2012. The

[53] Due to the overlapping nature of species habitats and other offset values on site, impact areas to be offset should not be totalled.

proponent is currently in the process of acquiring this property, therefore higher certainty can be provided that it can be secured in the future as an offset site.

I have stated conditions for the project's draft EA (Appendix 1, Schedule F), which would require the proponent to prepare a Biodiversity Offset Delivery Agreement within three years from the grant of the EA. The Biodiversity Offset Delivery Agreement would detail the final offset sites proposed to meet MNES (and state-significant biodiversity value) requirements, results of ground-truthing and an updated EPBC assessment on the offset sites. This would include updating the EPBC Act Offset Assessment Guide calculations for the offset site based on the final preferred sites chosen and results of ground-truthing, and legally securing the approved offset sites within six months of the Biodiversity Offset Delivery Agreement being approved.

SEWPaC has advised that it will conduct its own assessment regarding the nature of the impacts and the adequacy of the offsets proposed in the Kevin's Corner Biodiversity Offset Plan. Accordingly, offsets to satisfy EPBC Act requirements have not been determined. SEWPaC has advised that it will take into account the State's offset requirements and condition setting and will avoid duplication where it occurs.

8.13. Coordinator-General's overall conclusions and recommended conditions

I have reviewed the EIS and associated documentation, including the Supplementary MNES Report, and conclude that the proponent has adequately assessed the impacts of the project on TECs and threatened flora and fauna species listed under the EPBC Act. I am satisfied that the proponent has used the 'avoid, mitigate, offset' hierarchy of principles to guide its assessment and ensure the project would not result in unacceptable impacts on MNES.

I note the proponent has made a number of commitments to avoid and mitigate impacts on TECs, threatened flora and fauna species and high-value MNES habitat. The proponent would be required to implement all measures contained within its EMPs (and sub-plans) in accordance with the provisions of the EP Act (mine tenement) and Appendix 2 of this report (off-lease road and rail spur components). I consider that the mitigation measures presented in these plans are adequate.

I have stated conditions which would require the proponent to detail the final offset sites proposed to satisfy MNES (and state-significant biodiversity values) offset requirements.

I have also stated a number of draft EA conditions to ensure effective rehabilitation of the project site (Appendix 1, Schedule F). In particular, all land disturbed by mining activities must be rehabilitated in accordance with rehabilitation completion criteria (as specified in the RMP) and rehabilitation must commence progressively as areas become available.

I have sought (as part of a joint request for advice with SEWPaC) and taken into account advice of the IESC, including advice that specifically relates to MNES. I have stated a number of conditions and made recommendations that would apply to the construction and operation of the project in order to protect surface water and groundwater values (Appendices 1, 2, 3 and 4).

In order to address potential cumulative impacts on regional water resources, including potential impacts on existing water users, aquatic habitat loss and impacts on ecological systems, I have also made a recommendation to relevant State government departments for the collation of monitoring data and the risk-based assessment of regional cumulative impacts from proposed mining project activities (Appendix 4, Recommendations 7, 8 and 9).

As the protected matters of relevance to this MNES assessment are also protected under State legislation, I recommend the following conditions for inclusion as part of any EPBC Act approval in order to address potential impacts on MNES. These conditions would complement the conditions or recommendations set by me for subsequent State approvals to be obtained by the proponent.

Recommended conditions

Condition 1. Disturbance limits

(a) The following maximum disturbance limits (Table 1) apply to authorised unavoidable adverse impacts on MNES as a result of exploration, development, operation and decommissioning of the project, for the life of the project:

Table 1: Maximum disturbance limits for listed threatened species

Species	EPBC Act status	High-value habitat (ha)
Black-throated finch (southern) (*Poephila cincta cincta*)	Endangered	1000
Ornamental snake (*Denisonia maculata*)	Vulnerable	845
Brigalow scaly-foot (*Paradelma orientalis*)	Vulnerable	1415
Koala (*Phascolarctos cinereus*)	Vulnerable	768
Red goshawk (*Erythrotriorchis radiatus*)	Vulnerable	1201
Yakka skink (Egernia rugosa)	Vulnerable	1415
King blue-grass (*Dichanthium queenslandicum*)	Vulnerable	59
Squatter pigeon *(Geophaps scripta scripta)*	Vulnerable	1158

Condition 2. Species management plans

(a) In order to maximise the ongoing protection and long-term conservation of threatened species known or likely to occur within the project area, prior to construction of the project the person undertaking the action must submit for approval of the Commonwealth Environment Minister, Species Management Plans (prepared in accordance with the provisions of the *Nature Conservation Act 1992 (Qld))* for threatened and/or migratory species listed in Table 2:

Table 2: Species requiring a Species Management Plan

Species	EPBC Act status
Birds	
Eastern great egret (*Ardea modesta*)	Migratory
Rainbow bee-eater (*Merops ornatus*)	Migratory

Cattle egret (*Ardea ibis*)	Migratory
Fork-tailed swift (*Apus pacificus*)	Migratory
Squatter pigeon *(Geophaps scripta scripta)*	Vulnerable
Red goshawk (*Erythrotriorchis radiatus*)	Vulnerable
Black-throated finch (southern) (*Poephila cincta cincta*)	Endangered
Reptiles	
Ornamental snake (*Denisonia maculata*)	Vulnerable
Yakka skink (Egernia rugosa)	Vulnerable
Brigalow scaly-foot (*Paradelma orientalis*)	Vulnerable
Mammals	
Koala (*Phascolarctos cinereus*)	Vulnerable
Flora	
King blue-grass (*Dichanthium queenslandicum*)	Endangered

(b) Each Species Management Plan must:

(i) Identify relevant guidelines, policies and plans (e.g. Recovery Plans)

(ii) detail species' on-site habitat requirements

(iii) identify specific impacts on that species during each project phase and how impacts will be avoided and/or mitigated and managed. Impacts must include relevant direct and indirect impacts of the project, including but not limited to:

(A) vegetation clearing for open cut mining and infrastructure areas

(B) subsidence from underground mining

(C) mine dewatering impacts on perched aquifers

(D) hydrological changes due to stream diversions and flood levees

(E) weeds and pests

(iv) identify relevant site rehabilitation measures, timeframes, standards and methods

(v) identify specific monitoring and reporting requirements to be implemented

(vi) specify performance criteria to be achieved through implementation of the Species Management Plan.

(c) Where species share similar habitat preferences and management requirements, Species Management Plans for multiple species, such as migratory bird species, may be combined into one Species Management Plan.

Condition 3. Direct offsets

(a) Based on an assessment of the project's residual adverse impacts on MNES and a review of the suitability of the proposed offset site(s) (using the EPBC Act Offsets Assessment Guide, 2012), the person undertaking the action must register a legally binding conservation covenant over offset areas of no less than:

(i) X ha[54] of an equivalent or better quality of habitat for the black-throated finch

(ii) X ha[54] of an equivalent or better quality of habitat for the ornamental snake

(iii) X ha[54] of an equivalent or better quality of habitat for the Brigalow scaly-foot

(iv) X ha[54] of an equivalent or better quality of habitat for the koala

(v) X ha[54] of an equivalent or better quality of habitat for the red goshawk

(vi) X ha[54] of an equivalent or better quality of habitat for the yakka skink

(vii) X ha[54] of an equivalent or better quality habitat for the king blue-grass.

Note 1: Offset areas described in Condition 3(a) do not necessarily need to be separate if the same areas can meet the listing criteria for the EPBC listed threatened species as defined in the EPBC listing advice for that threatened species and meet the requirements of Condition 3(a).

Note 2: Offset areas listed in Condition 3(a) are subject to results of ground-truthing of the proposed offset areas and validation of condition scores through the EPBC Act Offsets Assessment Guide, 2012. The final offset areas for each MNES species will be confirmed in the final Biodiversity Offset Plan (Condition 4)

(b) For all species identified in Condition 3(a), the person taking the action must verify through an independent review by an Appropriately Qualified Person[55] the quantity and quality of habitat within all proposed offset areas including those proposed in the Kevin's Corner Biodiversity Offset Plan and any additional offsets as required at Condition 9.

(c) If the independent review finds that the offset areas do not meet the requirements of conditions 3(a) and 3(b), then additional areas must be included in the offset areas until all relevant criteria under these conditions are met.

Condition 4. Biodiversity Offset Plan

(a) A Biodiversity Offset Plan must be developed by an appropriately qualified person.

(b) The Biodiversity Offset Plan must:

(i) include the results of the independent review under Condition 3(b)

(ii) identify and quantify impacts on any MNES

(iii) identify how the impacts of subsided areas will be monitored and identified to determine that sufficient offset areas have been provided in accordance with the relevant maximum disturbance limits identified in Condition 1 and offset areas identified in Condition 3(a)

(c) The Biodiversity Offset Plan identified in Condition 4(a) must be provided to the Federal Environment Minister prior to the commencement of mining activities.

Condition 5. Biodiversity Offset Delivery Agreement

(a) A Biodiversity Offset Delivery Agreement must be developed by an appropriately qualified person.

(b) The Biodiversity Offset Delivery Agreement must:

(i) quantify the offset requirements and include a detailed description of the surveyed locations of MNES habitat, having regard to the independent review under Condition 3(b)

[54] To be determined by SEWPaC

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

(ii) identify the land (including the land on which the relevant mining activity is carried out) or other land in the State which may have the relevant MNES values. Preferably, the identified land should be located within areas mapped as priority 1 and 2 areas to provide for long-term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP). However if land within this area is not able to be utilised for offsets, the Biodiversity Offset Delivery Agreement should identify reasons for adoption of an alternative approach

(iii) include details on the delivery of offsets as per Condition 6

(iv) be submitted to the Federal Environment Minister for approval by X years[56] of the date of this approval.

Condition 6. Offset delivery

The person undertaking the action must provide a Legally Secured offset for any land identified in Condition 5 within 6 months of the Minister's written approval of the Biodiversity Offset Delivery Agreement.

Condition 7. Legally secured offsets

(a) The person undertaking the action must develop an Offset Area Management Plan for the land that is Legally Secured under Condition 6.

(b) The Offset Area Management Plan must contain the following information:

(i) the proposed management of land to ensure the environmental values of the land are maintained or enhanced

(ii) management and environmental objectives and outcomes, performance criteria and monitoring requirements

(iii) an analysis of the risks to achieve the objectives and outcomes

(iv) any restrictions imposed on the use of the offset area, including the management/control of weeds, cattle and site access

(v) the activities that will be undertaken to achieve the objectives and outcomes, including the management/control of weeds, site access, erosion and sediment and fire management

(vi) a map that shows spatially the areas subject to the Offset Area Management Plan

(vii) a reporting programme.

Condition 8. Review of the Biodiversity Offset Plan and Biodiversity Offset Delivery Agreement

(a) The Biodiversity Offset Plan and the Biodiversity Offset Delivery Agreement must be reviewed every fifth year from the grant of this approval and a report prepared by an appropriately qualified person. The report must:

(i) assess the area of MNES values proposed to be impacted by the mining activities, including those areas that may be affected by subsidence, and

[56] To be determined by SEWPaC

(ii) identify the actual areas of MNES values impacted by the mining activities.

(b) Where the actual areas of disturbance to MNES values is identified as greater than the proposed area of disturbance as per Condition 8(a), the person undertaking the action must develop a supplementary Biodiversity Offset Delivery Agreement.

Condition 9. Supplementary Biodiversity Offset Delivery Agreement

(a) The Supplementary Biodiversity Offset Delivery Agreement, if required under Condition 8(b), must:

(i) quantify the offset requirements and include a detailed description of the surveyed locations of MNES values, having regard to the assessment conducted under Condition 3(b) and the additional actual impact area identified under Condition 8(a) (additional to the proposed impacts identified within the Biodiversity Offset Plan and previously offset under the Biodiversity Offset Delivery Agreement)

(ii) identify the land, (including the land on which the relevant mining activity is carried out) or on other land in the State which may have the relevant MNES values. Preferably the identified land should be located within areas mapped as priority 1 and 2 areas to provide for long-term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP). However if land within this areas is not able to be utilised for offsets, the Supplementary Biodiversity Offset Delivery Agreement should identify reasons for adopting an alternative approach

(iii) include details on the delivery of offsets as per Condition 10.

(b) The Supplementary Biodiversity Offset Delivery Agreement must be submitted to the Minister for approval within 3 months of the completed date of the review report required under Condition 8a.

Condition 10. Supplementary Offset Delivery

(a) The person undertaking the action must provide a Legally Secured offset for any land identified in Condition 9 within 12 months of the Federal Environment Minister's approval of the Supplementary Biodiversity Offset Delivery Agreement.

9. Conclusion

The Kevin's Corner project has undergone a comprehensive environmental impact assessment. In undertaking my evaluation of the EIS, I have considered the following:

- the EIS and SEIS prepared for this project
- submissions on the EIS and SEIS, including agency advice
- Additional supplementary documentation provided to the Coordinator-General by the proponent as requested.

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 environmental effects of the project.

The environmental assessment commenced with the declaration of this project in September 2009 and has involved a comprehensive body of work by the proponent.

This evaluation has resulted in the development of mitigation measures and management strategies, the implementation of which is to be achieved through the required conditions on current approvals, and recommendations to guide future assessments.

Additional information and investigations will continue to be provided during the detailed design phases of the project and through the further assessments undertaken as part of subsequent Australian, State and Local Government approval processes.

The potential impacts identified in the EIS documentation and submissions have been assessed. I consider that the mitigation measures adopted by the proponent and required by the conditions stated in this report would result in acceptable overall outcomes. Further, a Biodiversity Offsets Plan has been provided by the proponent in order to address residual impacts.

With workforce numbers expected to peak at around 1800 workers in the third year of construction, and remain constant at 1600-1700 workers for most of the project's duration, the project is expected to provide long-term local, sub-regional and regional employment opportunities. In addition to the direct economic benefits for individuals and local communities associated with these jobs, the mine's support requirements and the ongoing training and development needs of the workforce represent an important opportunity to help diversify the local economy.

The proponent's commitments to maximising local employment over the life of the project, implementing local training strategies that also support critical non-mining activity, and providing local businesses with fair and reasonable opportunity to tender for project-related business, would ensure that the project would make a positive contribution to the local community.

Accordingly, I approve that the Kevin's Corner project proceed, subject to the conditions and recommendations in appendices Appendix 1, Appendix 2 and Appendix 3 and Appendix 4. In addition, it is expected that the proponent's commitments contained within the Updated Proponent Commitment Register (Appendix 7 of this report) will be fully implemented.

Section 8 of this report describes the extent to which the information provided by the proponent addresses the predicted impacts on MNES of each controlled action for the

project. SEWPaC has been consulted in the evaluation of the potential impacts and the adequacy of information with respect to MNES, during the preparation of this report. SEWPaC has advised that the report provides the required information for the Commonwealth Environment Minister to make an EPBC Act decision. Therefore, it is considered that the requirements of the bilateral agreement relating to the project have been satisfied.

This report includes the following:

- draft EA conditions stated under section 47C of the SDPWO Act (refer to Appendix 1);
- off-lease road and rail spur conditions (refer to Appendix 2);
- imposed conditions under section 54B of the SDPWO Act (refer to Appendix 3); and
- recommendations under section 52 of the SDPWO Act (refer to Appendix 4).

To proceed further, the proponent will be required to:

- obtain EPBC Act approval;
- obtain a range of State and Local Government approvals required for the project;
- finalise and implement the construction and operations environmental management plans; and
- finalise the Biodiversity Offset Plan and Delivery Agreement.

If there are any inconsistencies between the project (as described in the EIS documentation) and the conditions in this report, the conditions shall prevail. The proponent must implement all the conditions of this report.

Section 8 of this report describes the extent to which the material supplied by HGPL addresses the actual or likely impacts on MNES of each controlled action for the project.

A copy of this report will be available on the Department of State Development, Infrastructure and Planning's website at **http://www.dsdip.qld.gov.au/kevinscorner**

This report will lapse in accordance with the provisions of section 35A of the SDPWO Act. But generally the report will lapse three years from the date it is published on the department's website, or when an approval application is decided for the project, unless a later time is decided by the Coordinator-General.

Appendix 1. Stated conditions – mine environmental authority

This appendix includes the Coordinator-General's stated conditions[57] for the draft environmental authority (mining lease) for the Kevin's Corner project under the *Environmental Protection Act 1994* and are stated pursuant to section 47C of the *State Development and Public Works Organisation Act 1971*.

The appendix is structured as follows:

Schedule A – General

Schedule B – Air

Schedule C – Water

Schedule D – Noise

Schedule E – Waste

Schedule F – Land

Schedule G – Regulated structures

Schedule H – Sewage treatment

Schedule I – Water treatment

Schedule J – Figures

Schedule K – Definitions

Attachment A – Rehabilitation requirements

Attachment B – Watercourse subsidence

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 *Table 1: Mining Domains, Figure 1: Overall Site Layout Domain Plan; Figure 2: Site Layout Showing Domain 1; Figure 3: Site Layout Showing Domain 2; Figure 4: Site Layout Showing Domain 3; Figure 5: Site Layout Showing Domain 4; Figure 6: Site Layout Showing Domain 5,* and *Figure 7: Site Layout Showing Domain 6*.

[57] For a definition of 'stated condition', refer to the Glossary on page 442 of this report.

Table 1: Mining Domains

Mine Domain	Description	Location	Maximum disturbance areas
1. Infrastructure	Includes CHPP, ROM Stockpiles, workshops, landfill, raw water dam, administration areas.	See Figure 2	2,566 ha
2. Pits, Voids and Overburden Emplacements	Includes Void Pit 1, Void Pit 2, borrow pit and overburden	See Figure 3	3,315 ha
3. Tailings Storage Facility	Tailings Dam	See Figure 4	420 ha
4. Dams and Surface Water Features	See Table 18: Basic Details of Regulated Dams	See Figure 5 and Table 17: Location of Regulated Structures	360 ha
5. Modeled Significant State Significant Biodiversity Values (SSBV) Subsidence Impacted Areas	Areas of subsidence modeled as likely to significantly impact SSBV.	See Figure 6	632 ha
6. Other Lands	Other lands including exploration, groundwater monitoring bores, and underground mining	See Figure 7	30,087 ha
		Total	**37,380 ha**

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; and

(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 authority, all monitoring records or reports required by this environmental authority must be kept for a period of not less than 5 years.

A5 The holder of this environmental authority must implement a monitoring program that enables the holder and the administering authority to determine compliance with the environmental authority conditions.

Financial Assurance

A6 Provide to the administering authority financial assurance for the amount and in the form acceptable to the administering authority in accordance with the most recent edition of the administering authority's Guideline – Calculating financial assurance for mining projects, before the proposed mining activities can commence.

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

Risk Management

A8 The holder of this environmental authority must develop and implement a risk management system for mining activities which mirrors the content requirements of the *Standard for Risk Management (ISO31000:2009)*, or the latest edition of an Australian Standard for risk management, to the extent relevant to the environmental management, prior to the commencement of mining activities.

Notification of emergencies, incidents and exceptions

A9 The holder of this environmental authority must notify the administering authority of any non-compliance with any condition of this environmental authority within 24 hours after becoming aware of the non-compliance.

(Note: a notification of an exceedance under condition C18 does not require additional notification under condition A9)

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 not to be 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; and

(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 the following details:

(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; and

(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 authority, obtain from a suitably qualified and experienced third party a report on compliance with the conditions of this environmental authority;

(b) obtain further such reports at regular intervals not exceeding three years 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 published externally to this environmental authority and the standard is amended or changed to provide a better environmental outcome, subsequent to the issue of this environmental authority, the holder 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; and

(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.

Unless the holder can demonstrate that the existing system provides compliance with the intent of this EA and the proposed changes do not impact on the validity of existing background information.

Coal Extraction

A16 The environmental authority holder is approved for a coal extraction rate of up to 45 million tonnes per annum (Mtpa) of run-of-mine (ROM) ore in accordance with this environmental authority.

Schedule B – Air

B1 Dust and particulate matter must not exceed the following levels when measured at any sensitive place.

(a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of Australian Standard *AS3580.10.1 Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method*.

(b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM_{10}) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time with no more than five exceedences[58] recorded over twelve months, when monitored in accordance with the most recent version of either:

(i) Australian Standard *AS3580.9.6 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method*, or

(ii) Australian Standard *AS3580.9.9 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} low volume sampler – Gravimetric method*, or

(iii) Australian Standard *AS3580.9.8 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} continuous direct mass method using a tapered element oscillating microbalance (TEOM) 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* or using an alternative sampling methodology determined in consultation with EHP.

[58] These five exceedences (as allowed for in the EPP (Air)) are for natural events such as bush fires and dust storms.

Schedule C – Water

Release of Contaminants

C1 Contaminants that will or have the potential to cause environmental harm must not be released directly or indirectly to any waters except as permitted under the conditions of this environmental authority.

Discharge of Mine Affected Water

C2 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 2: Mine Affected Water Release Points, Sources and Receiving Waters and depicted in Figure 8: Mine Affected Water Release Points attached to this environmental authority.

Table 2: Mine Affected Water Release Points, Sources and Receiving Waters

Release Point (RP)	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Contaminant Source and Location	Monitoring Point	Receiving Waters Description
RP1	-23.0703	146.4299	Mine Water Dam 1 (MWD1)	Outlet works direct into Middle Creek – from release point	Middle Creek
RP2	-23.0658	146.4994	Mine Water Dam 2 (MWD2)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP3	-23.0900	146.4991	Mine Water Dam 3 (MWD3)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP4	-23.1038	146.5046	Mine Water Dam 4 (MWD4)	Outlet works direct into Sandy Creek – from release point	Sandy Creek
RP6	-23.0736	146.5263	Mine Water Dam 2 (MWD2)	Spillway	Sandy Creek
RP7	-23.0897	146.5048	Mine Water Dam 3 (MWD3)	Spillway	Sandy Creek
RP8	-23.1031	146.5113	Mine Water Dam 4 (MWD4)	Spillway	Sandy Creek

C3 The release of mine affected water to internal water management infrastructure that is installed and operated in accordance with a Water Management Plan that complies with conditions C34 to C39 inclusive is permitted.

C4 The release of mine affected water to waters in accordance with condition C2 must not exceed the release limits stated in *Table 3: Mine Affected Water Release Limits*, when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*, for each quality characteristic.

Table 3: Mine Affected Water Release Limits

Quality Characteristic	Release Limit	Monitoring Frequency
Electrical conductivity (μS/cm)	Release limits specified in Table 6 for variable flow criteria.	Continuously
pH (pH Unit)	6.5 (minimum) 9.0 (maximum)	Continuously
Turbidity (NTU)	264	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.
Suspended Solids (mg/L)	53	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.
Sulphate (SO_4^{2-}) (mg/L)	Release limits specified in Table 6 for variable flow criteria.	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the duration of the release.

C5 The release of mine affected water to waters from the release points must be monitored at the locations specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters* for each quality characteristic and at the frequency specified in *Table 3: Mine Affected Water Release Limits* and *Table 4: Release Contaminant Trigger Investigation Levels*.

C6 If quality characteristics of the release exceed any of the trigger levels specified in *Table 4: Release Contaminant Trigger Investigation Levels* during a release event, the environmental authority holder must compare the downstream results in the receiving waters to the trigger values specified in *Table 4: Release Contaminant Trigger Investigation Levels* and:

(a) where the trigger values are not exceeded then no action is to be taken; or

(b) where the downstream results exceed the trigger values specified in *Table 4: Release Contaminant Trigger Investigation Levels* for any quality characteristics, compare the results of the downstream site to the data from background monitoring sites and:

(i) if the result is less than the background monitoring site data, then no action is to be taken; or

(ii) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority in the next annual return, outlining:

- details of the investigations carried out; and

• actions taken to prevent environmental harm.

(Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C6 b) ii. of this condition, no further reporting is required for subsequent trigger events for that quality characteristic)

C7 If an exceedance in accordance with condition C6 b) ii. is identified, the holder of the authority must notify the administering authority within 14 days of receiving the result.

Table 4: Release Contaminant Trigger Investigation Levels

Quality Characteristic	Trigger Level[3]	Monitoring Frequency
Aluminium (μg/L) [1]	220	Monitoring to be commenced within 2 hours of commencement of the release, and then at 24 hour intervals thereafter.
Arsenic (μg/L) [1]	13	
Cadmium (μg/L) [1]	0.2	
Chromium (μg/L) [1]	1.0	
Copper (μg/L) [1]	2	
Iron (μg/L) [1]	610	
Lead (μg/L) [1]	3.4	
Mercury (μg/L) [1]	0.1	
Nickel (μg/L) [1]	11	
Zinc (μg/L) [1]	11	
Boron (μg/L) [1]	370	
Cobalt (μg/L) [1]	1.4	
Manganese (μg/L) [1]	1900	
Molybdenum (μg/L) [1]	34	
Selenium (μg/L) [1]	10	
Silver (μg/L) [1]	10	
Uranium (μg/L) [1]	1	
Vanadium (μg/L) [1]	10	
Ammonia as N (μg/L) [1]	900	
Nitrate as NO_3 (μg/L) [1]	1100	
Petroleum hydrocarbons (C6-C9) (μg/L) [1]	20	
Petroleum hydrocarbons (C10-C36) (μg/L) [1]	100	
Fluoride (μg/L) [2]	2000	
Sodium (μg/L) [1]	180000	

[1] All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
[2] Fluoride must be measured as total (unfiltered).
[3] Levels below the LOR to be classified as non-detects

Mine Affected Water Release Events

C8 The holder of this environmental authority must ensure a stream flow gauging stations is/are installed, operated and maintained to determine and record stream flows at the locations and flow recording frequency specified in *Table 5: Mine Affected Water Release during Flow Events*.

C9 Notwithstanding any other condition of this environmental authority, the release of mine affected water to receiving waters in accordance with condition C2 must only take place during periods of natural flow events in accordance with the receiving water flow criteria for discharge specified in *Table 5: Mine Affected Water Release during Flow Events* when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.

C10 The release of mine affected water to receiving waters in accordance with condition C2 must no exceed the Electrical Conductivity and Sulphate release limits or the Maximum Release Rate (for all combined release points flows) for each receiving water flow criteria for discharge specified in *Table 5: Mine Affected Water Release during Flow Events* when measured at the monitoring points specified in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.

Table 5: Mine Affected Water Release during Flow Events

Receiving Waters	Release Point (RP)	Gauging Station[1]	Gauging Station Latitude (decimal degree, GDA94)[1]	Gauging Station Longitude (decimal degree, GDA94)[1]	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m^3/s)	Maximum Release Rate for all Combined RP flows (m^3/s)	Electrical Conductivity and Sulphate Release Limits
Sandy Creek	RP2, RP3, RP4, RP5, RP6, RP7	Sandy Creek Gauging Station	-23.0756	146.4986	Continuous	<4.3m^3/s for a period of 28 days after natural flow events that exceed 4.3m^3/s	<0.2 m^3/s	Maximum Electrical Conductivity: 168 µS/cm Maximum Sulphate (SO_4^{2-}): 250 mg/L
						>4.3m^3/s	<0.35m^3/s	Maximum Electrical Conductivity: 1500 µS/cm Maximum Sulphate (SO_4^{2-}): 600 mg/L

Receiving Waters	Release Point (RP)	Gauging Station[1]	Gauging Station Latitude (decimal degree, GDA94)[1]	Gauging Station Longitude (decimal degree, GDA94)[1]	Receiving Water Flow Recording Frequency	Receiving Water Flow Criteria for discharge (m^3/s)	Maximum Release Rate for all Combined RP flows (m^3/s)	Electrical Conductivity and Sulphate Release Limits
						>15m^3/s	<0.45m^3/s	Maximum Electrical Conductivity: 3500 µS/cm Maximum Sulphate (SO_4^{2-}): 1500 mg/L
Middle Creek	RP1	Middle Creek Gauging Station	-23.0777	146.4327	Continuous	Low Flow <0.5m^3/s for a period of 28 days after natural flow events that exceed 1m^3/s	<0.2 m^3/s	Maximum Electrical Conductivity: 168 µS/cm Maximum Sulphate (SO_4^{2-}): 250 mg/L
						Medium Flow >1m^3/s	<0.97m^3/s	Maximum Electrical Conductivity: 1200 µS/cm Maximum Sulphate (SO_4^{2-}): 500 mg/L
						> 5 m3/s	<1.1m^3/s	Maximum Electrical Conductivity: 3500 µS/cm Maximum Sulphate (SO_4^{2-}): 1300 mg/L
						High Flow >10m^3/s	<1.1m^3/s	Maximum Electrical Conductivity: 5000 µS/cm Maximum Sulphate (SO_4^{2-}): 2500 mg/L

C11 The daily quantity of mine affected water released from each release point must be measured and recorded at the monitoring points in *Table 2: Mine Affected Water Release Points, Sources and Receiving Waters*.

C12 Releases to waters must be undertaken so as not to cause erosion of the bed and banks of the receiving waters, or cause a material build up of sediment in such waters.

Cessation of Release

C13 During the release of mine affected water to receiving waters from the release points, the receiving waters must be monitored at the locations specified in *Table 6: Receiving waters release limits* for each quality characteristic and at the frequency specified in *Table 6: Receiving waters release limits*.

C14 Notwithstanding any other condition of this environmental authority, the release of mine affected water :

(a) must not commence if the water quality at the upstream site exceeds the water quality characteristics in *Table 6: Receiving water release limits;* and

(b) must cease if the water quality characteristics at the downstream or the upstream sites in *Table 6: Receiving waters release limits* are met and or exceeded.

Table 6: Receiving waters release limits

Monitoring Point	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Quality Characteristic	Limit	Monitoring Frequency
Upstream					
MP1	-23.1113	146.5075	Electrical conductivity (μS/cm)	700	Continuously
MP11	-23.1311	146.4170	Electrical conductivity (μS/cm)	700	Continuously
Downstream					
MP4	-22.9985	146.5116	Electrical conductivity (μS/cm)	700	Continuously

C15 In accordance with conditions C14(b), the release of mine affected water may recommence after a cessation if the water quality characteristics in *Table 6: Receiving waters release limits* are at levels below the water quality characteristics at the downstream and upstream sites in *Table 6: Receiving waters release limits*.

(Note: If the release of mine affected water is ceased under condition C14, and the water quality within the receiving environment drops below the water quality characteristic limit in Table 6: Receiving water release limits, the release may recommence if all other release conditions are complied with)

Notification of Release Event

C16 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) expected release cessation date/time;

(c) release point/s;

(d) release rate and volume (estimated);

(e) receiving water/s including the natural flow rate; and

(f) details (including available data) regarding likely impacts on the receiving water(s).

(Note: Notification to the administering authority must be addressed to the Manager and Project Manager of the local administering authority via email or facsimile)

C17 The environmental authority holder must notify the administering authority as soon as practicable (nominally within 24 hours after cessation of a release event) of the cessation of a release notified under condition C16 and within 28 days provide the following information in writing:

(a) release cessation date/time;

(b) natural flow volume 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. contamination limits, natural flow, discharge volume);

(e) all in-situ water quality monitoring results; and

(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 C17 and C18, provided the relevant details of the release are included within the notification provided in accordance with conditions C16 and C17.

Notification of Release Event Exceedance

C18 If the release limits defined in *Table 3: 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.

C19 The authority holder must, within 28 days of a release that exceeds the conditions of this authority, provide a report to the administering authority detailing:

(a) the reason of the release;

(b) the location of the release;

(c) all water quality monitoring results;

(d) any general observations;

(e) all calculations; and

(f) any other matters pertinent to the water release event.

Monitoring of Water Storage Quality

C20 Water storages containing mine affected water which are accessible to livestock must be monitored for the water quality characteristics and at the monitoring frequency specified in *Table 7: Onsite Water Storage Contaminant Limits*.

C21 In the event that water storages exceed the contaminant limits defined in *Table 7: Onsite Water Storage Contaminant Limits*, the holder of the environmental authority must implement measures, where practicable, to prevent access to waters by all livestock.

Table 7: Onsite Water Storage Contaminant Limits

Quality Characteristic	Water Storage Contaminant Limit	Monitoring Frequency
pH (pH unit)	6.5 (minimum) 9.0 (maximum)	Quarterly
EC (µS/cm)	5970	
Sulphate (mg/L)	1000[1]	
Fluoride (mg/L)	2[1]	
Aluminium (mg/L)	5[1]	
Arsenic (mg/L)	0.5[1]	
Cadmium (mg/L)	0.01[1]	
Cobalt (mg/L)	1[1]	
Copper (mg/L)	1[1]	
Lead (mg/L)	0.1[1]	
Nickel (mg/L)	1[1]	
Zinc (mg/L)	20[1]	

[1] All metals and metalloids must be measured as total (unfiltered).

Receiving Environment Monitoring and Contaminant Trigger Levels

C22 The quality of the receiving waters must be monitored at the locations specified in *Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations* and shown in *Figure 9: Receiving Water Upstream Background and Downstream Monitoring Locations* for each quality characteristic and at the monitoring frequency stated in *Table 9: Receiving Waters Contaminant Trigger Levels*.

Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations

Monitoring Point (MP)	Receiving Waters Location Description	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Upstream Background Monitoring Locations			
MP1	Sandy Creek: 1,100m upstream of RP4/RP7; and 2,600m upstream of RP3/RP6	-23.1113	146.5053
MP7	Well Creek 8,700m upstream of RP5	-23.0203	146.3909
MP8	Middle Creek: 600m upstream of RP1	-23.0776	146.4327
MP11	Little Sandy Creek: 8200m upstream of RP1 and 1500m upstream of the diversion	-23.1311	146.4170
Downstream Monitoring Locations			
MP6	Middle Creek: 5,250m downstream of RP1	-23.3045	146.4648
MP2	Sandy Creek: 1,600m downstream of RP3/RP6; and 3,300m downstream of RP4/RP7	-23.0756	146.4986
MP3	Sandy Creek 50m downstream of Well Creek Confluence: 3,100m downstream of RP2	-23.0396	146.5059
MP4	Sandy Creek downstream lease boundary: 15,800m downstream of RP1; 8,100m downstream of RP2; 10,800m downstream of RP3 12,500m; and downstream of RP4.	-22.9985	146.5116
MP5	Well Creek 50m upstream of Sandy Creek Confluence: 11,800m downstream of RP1; 11,500m downstream of RP5	-23.0401	146.5056

Table 9: Receiving Waters Contaminant Trigger Levels

Quality Characteristic	Receiving Water Trigger Level	Monitoring Frequency
pH	6.5 (minimum) 8.0 (maximum)	Continuously
Electrical Conductivity (μS/cm)	700	
Suspended solids (mg/L)	165	Monitoring to be commenced within 2 hours of commencement of the release, and then daily during the release.
Sulphate (SO_4^{2-}) (mg/L)	250	
Sodium (mg/L)	180	

C23 If quality characteristics of the receiving water at the downstream monitoring points exceed any of the trigger levels specified in *Table 9: Receiving Waters Contaminant Trigger Levels* during a release event the environmental authority holder must compare the downstream results to the upstream results in the receiving waters and:

(a) where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or

(b) where the 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:

(i) details of the investigations carried out; and

(ii) actions taken to prevent environmental harm.

(Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C23 b)of this condition, no further reporting is required for the subsequent trigger events for that quality characteristic)

Receiving Environment Monitoring Program (REMP)

C24 The environmental authority holder must develop and implement a Receiving Environment Monitoring Program (REMP) to monitor, identify and describe any adverse impacts to surface water environmental values, quality and flows due to the authorised mining activity. This must include monitoring the effects of the mine on the receiving environment periodically (under natural flow conditions) and while mine affected water is being discharged from the site.

For the purpose of the REMP, the receiving environment is the waters of Lagoon Creek and Sandy Creek and connected or surrounding waterways within 10km downstream of the release. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised mining activity that will potentially be directly affected by an authorised release of mine affected water.

C25 The Receiving Environment Monitoring Program (REMP) must:

(a) assess the condition or state or receiving waters, including upstream conditions, spatially within the REMP area, considering background water quality

characteristics based on accurate and reliable monitoring data that takes into consideration temporal variation (e.g. seasonality); and

(b) be designed to facilitate assessment against water quality objectives for the relevant environmental values that need to be protected;

(c) include monitoring from background reference sites (e.g. upstream or background) and downstream sites from the release (as a minimum, the locations specified in *Table 8: Receiving Water Upstream Background and Downstream Monitoring Locations*;

(d) specify the frequency and timing of sampling required in order to reliably assess ambient conditions and to provide sufficient data to derive site specific background reference values in accordance with the *Queensland Water Quality Guidelines* (2006). This should include monitoring during periods of natural flow irrespective of mine or other discharges;

(e) include monitoring and assessment of dissolved oxygen saturation, temperature and all water quality parameters listed in *Table 3: Mine Affected Water Release Limits* and *Table4: Release Contaminant Trigger Investigation Levels*;

(f) include, where appropriate, monitoring of metals/metalloids in sediments (in accordance with ANZECC & ARMCANZ (2000), BATLEY and/or the most recent version of AS5667.1 *Guidance on Sampling of Bottom Sediments*);

(g) include, where appropriate, monitoring of macroinvertebrates in accordance with the AusRivas methodology;

(h) apply procedures and/or guidelines from ANZECC and ARMCANZ (2000) and other relevant guidelines and documents;

(i) describe sampling and analysis methods and quality assurance and control; and

(j) incorporate stream flow and hydrological information in the interpretations of water quality and biological data.

C26 A Receiving Environment Monitoring Program (REMP) Design Document that addresses each criterion presented in Conditions C24 and C25 must be prepared and submitted to the administering authority prior to commencement of activities. Due consideration must be given to any comments made by the administering authority on the REMP Design Document and subsequent implementation of the program.

C27 A report outlining the findings of the Receiving Environment Monitoring Program, including all monitoring results and interpretations in accordance with conditions C24 and C25 must be prepared annually and made available on request to the administrating authority. This must include an assessment of background reference water quality, the condition of downstream water quality compared against water quality objectives, and the suitability of current discharge limits to protect downstream environmental values.

Water Reuse

C28 Mine affected water may be piped, trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder for a third party for the purpose of:

(a) supplying stock water subject to compliance with the quality release limits specified in *Table 10: Stock Water Release Limits*; or

(b) supplying water for construction and/or road maintenance in accordance with the conditions of this environmental authority.

Table 10: Stock Water Release Limits

Quality Characteristics	Units	Minimum	Maximum
pH	pH units	6.5	8.5
Electrical Conductivity	µS/cm	N/A	5000

C29 Mine affected water may be piped, trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as dams or tanks, for the purpose of supplying water to Alpha Coal Mine. The volume, pH and electrical conductivity of water transferred to Alpha Coal Mine must be monitored and reported.

C30 If the responsibility of mine affected water is given or transferred to another person in accordance with C28 and C29:

(a) the responsibility for the mine affected water must only be given or transferred in accordance with a written agreement (third party agreement); and

(b) the third party agreement must be signed by both parties to the agreement.

C31 All determinations of water quality and biological monitoring must be:

(a) performed by a person or body possessing appropriate experience and qualifications to perform the required measurements;

(b) made in accordance with methods prescribed in the latest edition of the administering authorities Monitoring and Sampling Manual;

(c) collected from the monitoring locations identified within this environmental authority, with 6 hours of each other where possible;

(d) carried out on representative samples; and

(e) analysed at a laboratory accredited (e.g. NATA) for the method of analysis being used.

C32 The release of any contaminants as permitted by this environmental authority, directly or indirectly to waters, other than internal water management infrastructure that is

installed and operated in accordance with a Water Management Plan that complies with conditions of this environmental authority, must not:

(a) produce any visible discolouration of receiving waters; and

(b) produce any slick or other visible or odorous evidence of oil, grease or petrochemicals nor contain visible floating oil, grease, scum, litter or other objectionable matter.

C33 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 with each annual return:

(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 results of all monitoring and details of any exceedances of the conditions of this environmental authority; and

(f) water quality monitoring data must be provided to the administering authority in the specified electronic format upon request.

Water Management Plan

C34 A Water Management Plan must be developed by an appropriately qualified person and implemented prior to the commencement of mining activities.

C35 The Water Management Plan must:

(a) provide for effective management of actual and potential environmental impacts resulting from water management associated with the mining activity carried out under this environmental authority; and

(b) be developed in accordance with the administering authorities guideline *Preparation of water management plans for mining activities* and include:

(i) a study of the source of contaminants;

(ii) a water balance model for the site;

(iii) a water management system for the site;

(iv) measures to manage and prevent saline drainage;

(v) measures to manage and prevent acid rock drainage;

(vi) contingency procedures for emergencies; and

(vii) a program for monitoring and review of the effectiveness of the water management plan.

C36 The Water Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

(a) assess the plan against the requirements under condition C35;

(b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and

(c) identify any amendments made to the Water Management Plan following the review.

C37 The holder of this environmental authority must attach to the review report required by condition C36, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates, to:

(a) ensure compliance with this environmental authority; and

(b) prevent a recurrence of any non-compliance issues identified.

C38 The review report required by condition C36 and the written response to the review report required by condition C37 must be submitted to the administering authority with the subsequent annual return under the signature of the appointed signatory for the annual return.

C39 A copy of the Water Management Plan must be provided to the administering authority on request.

Saline Drainage

C40 The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of saline drainage.

Acid Rock Drainage

C41 The holder of this environmental authority must ensure proper and effective measures are taken to avoid or otherwise minimise the generation and/or release of acid rock drainage.

Stormwater and Water Sediment Controls

C42 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.

C43 Stormwater, other than mine affected water, is permitted to be released to receiving 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 C42;

(b) water management infrastructure that is installed and operated, in accordance with a Water Management Plan that complies with conditions C34 through C39, for the purpose of ensuring water does not become mine affected water.

C44 The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters.

Overflow of Mine Affected Water from Regulated Structures

C45 The overflow of mine affected water from one or more of the dams listed in *Table 17: Location of Regulated Structures* must only occur if:

(a) the holder has complied with **ALL** conditions listed in *Schedule G – Regulated Structures* of this environmental authority; and

(b) the overflow is a direct result of rainfall events which since November 1 have generated a total rainfall depth in excess of that determined under the Design Storage Allowance (DSA) annual exceedance probability (AEP) event listed in *Table 17: Location of Regulated Structures* for the relevant dam (or network of linked containment systems);

(c) the dam and release point is listed in *Table 11: Overflow release to the receiving* environment;

(d) the holder has taken all reasonable and practicable measures to prevent an overflow from the relevant dam; and

(e) the overflow of mine affected water does not cause serious or material environmental harm.

C46 Any release of mine affected water resulting from an overflow from one or more of the dams listed in *Table 17: Location of Regulated Structures* and *Table 11: Overflow release to the receiving environment* to receiving waters must be monitored at the locations specified in *Table 11:Overflow release to the receiving environment* and *Table 12: Monitoring Locations for Overflow Releases* for those quality characteristics and at the frequencies specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases.*

Table 11: Overflow Release to the Receiving Environment

Release Point (RP)	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Contaminant Source and Location	Receiving waters description
RP5	-23.0547	146.4194	Mine Water Dam 1 (MWD1)	Well Creek
RP6	-23.0736	146.5263	Mine Water Dam 2 (MWD2)	Sandy Creek
RP7	-23.0897	146.5048	Mine Water Dam 3 (MWD3)	Sandy Creek
RP8	-23.1031	146.5113	Mine Water Dam 4 (MWD4)	Sandy Creek
RP9	-23.0996	146.4270	Borefield Dam 1	Little Sandy/Rocky Creek Diversion
RP10	-23.1200	146.4269	Borefield Dam 2	Little Sandy/Rocky Creek Diversion

RP11	-23.1516	146.4404	Adit/ROM dam south	Green Tree Creek

Table 12: Monitoring Locations for Overflow Releases

Monitoring Point (MP)	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Associated release point	Monitoring Point description	Location description
Upstream					
MP7	-23.0203	146.3909	RP5	Well Creek	8,700m upstream of RP5
MP2	-23.0756	146.4986	RP6	Sandy Creek	1,600m downstream of RP7 and 3,300m downstream of RP8
MP1	-23.1113	146.5053	RP7	Sandy Creek	2500m upstream of RP7
MP1	-23.1113	146.5053	RP8	Sandy Creek	800m upstream of RP4/RP8
MP11	-23.1311	146.4170	RP9	Little Sandy Creek	4800m upstream of RP9
MP11	-23.1311	146.4170	RP10	Little Sandy Creek	2500m upstream of RP10
MP9	-23.1608	146.4193	RP11	Green Tree Creek	3,200m upstream, of RP11
Downstream					
MP5	-23.0401	146.5056	RP5	Well Creek	11,500m downstream of RP 5
MP3	-23.0396	146.5059	RP6	Sandy Creek	3,100m downstream of RP2
MP2	-23.0756	146.4986	RP7	Sandy Creek	1,600m downstream of RP7
MP2	-23.0756	146.4986	RP8	Sandy Creek	3,300m downstream ofRP8
MP8	-23.0776	146.4327	RP9	Middle Creek	2,550m downstream of RP9
MP8	-23.0776	146.4327	RP10	Middle Creek	5,550m downstream of RP10
MP1	-23.1113	146.5053	RP11	Sandy Creek	11,150m downstream of RP11

Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases

Quality Characteristic	Trigger Level[3]	Monitoring Frequency
Electrical conductivity (μS/cm)	700	Continuously
pH (pH Unit)	6 – 8.5	
Turbidity	250	
Suspended Solids (mg/L)	87	Monitoring to be commenced within 2 hours of commencement of the release and daily thereafter.
Sulphate (SO_4^{2-}) (mg/L)	500	
Aluminium (μg/L) [1]	410	
Arsenic (μg/L) [1]	13	
Cadmium (μg/L) [1]	0.2	
Chromium (μg/L) [1]	1.0	
Copper (μg/L) [1]	2.0	
Iron (μg/L) [1]	790	
Lead (μg/L) [1]	3.4	
Mercury (μg/L) [1]	0.2	
Nickel (μg/L) [1]	11	
Zinc (μg/L) [1]	8	
Boron (μg/L) [1]	370	
Cobalt (μg/L) [1]	90	
Manganese (μg/L) [1]	1900	
Molybdenum (μg/L) [1]	34	
Selenium (μg/L) [1]	10	
Silver (μg/L) [1]	1	
Uranium (μg/L) [1]	1	
Vanadium (μg/L) [1]	10	
Ammonia (μg/L) [1]	900	
Nitrate (μg/L) [1]	1100	
Petroleum hydrocarbons (C6-C9) (μg/L) [1]	**20**	
Petroleum hydrocarbons (C10-C36) (μg/L) [1]	**100**	
Fluoride (μg/L) [2]	2000	
Sodium (μg/L) [1]	180000	

[1] All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
Fluoride must be measured as total (unfiltered).
[3] Levels below the LOR to be classified as non-detects

C47 If quality characteristics of the release exceed any of the trigger levels specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* during an overflow release, the holder must compare the downstream results in the receiving waters to the trigger values specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* and:

(a) where the trigger values are not exceeded at downstream locations then no action is to be taken; or

(b) where the downstream results exceed the trigger values specified in *Table 13: Release Contaminant Trigger Investigation Levels – Overflow Releases* for any quality characteristics, compare the results of the downstream site to the data from background monitoring sites and from the release point and:

(i) if the result is less than the background monitoring site data, then no action is to be taken; or

(ii) if the result is greater than the background monitoring site data, complete an investigation into the potential for environmental harm and provide a written report to the administering authority within 28 days of the cessation of the release, outlining::

- details of the investigations carried out; and
- actions taken to prevent environmental harm.

(Note: Where an exceedance of a trigger level has occurred and is being investigated, in accordance with C47b) ii. of this condition, no further reporting is required for subsequent trigger events for that quality characteristic)

C48 The holder must notify the administering authority as soon as practicable and no later than 24 hours after the commencement of an overflow release of mine affected water to the receiving environment in accordance with conditions C46 and C47 of this environmental authority. Notification must include the submission of written advice to the administering authority of the following information:

(a) release commencement date/time;

(b) release points;

(c) receiving water/s; and

(d) any details (including available data) regarding likely impacts on the receiving environment.

(Note: Notification to the administering authority must be addressed to the Project Manager of the local administering authority via email or facsimile)

C49 The holder must notify the administering authority as soon as practicable and no later than 24 hours after the cessation of a release notified under condition C48. Notification must include the submission of written advice to the administering authority of the following information:

(a) release cessation date/time;

(b) volume of water released;

(c) all in-situ water quality monitoring results; and

(d) any other matters pertinent to the water release event.

(Note:: Successive or intermittent releases occurring within 24 hours of the cessation of any individual release can be considered part of a single release event and do not require individual notification for the purposed of compliance with conditions C48 and C49, provided the relevant details of the release are included within the notification provided in accordance with conditions C48 and C49))

C50 Within 28 days of a release notified under condition C48, the holder must provide a report to the administering authority demonstrating compliance with condition C45.

Groundwater

C51 A groundwater monitoring program must be developed by an appropriately qualified person that will determine compliance with the environmental authority conditions, prior to the commencement of mining activities.

Table 14: Groundwater Quality Triggers and Limits

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
		Minimum	Maximum	Minimum	Maximum	
Alluvium						
Aluminium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	N/A
Antimony	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Arsenic	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Iron	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Molybdenum	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Mercury	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Selenium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Silver	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Dissolved Solids	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Electrical Conductivity	µS/cm	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sulphate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Calcium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Magnesium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sodium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Potassium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Chloride	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Carbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Bicarbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Petroleum Hydrocarbons	ppb	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
pH	unit	TBA[1]	TBA[1]	TBA[1]	TBA[1]	

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
		Minimum	Maximum	Minimum	Maximum	
Bandana Formation						
Aluminium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	N/A
Antimony	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Arsenic	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Iron	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Molybdenum	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Mercury	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Selenium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Silver	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Dissolved Solids	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Electrical Conductivity	µS/cm	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sulphate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Calcium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Magnesium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sodium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Potassium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Chloride	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Carbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Bicarbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Petroleum Hydrocarbons	ppb	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
pH	unit	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Colinlea Sandstone						
Aluminium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	N/A
Antimony	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Arsenic	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Iron	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Molybdenum	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Mercury	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Selenium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Silver	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Dissolved Solids	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Electrical Conductivity	µS/cm	TBA[1]	TBA[1]	TBA[1]	TBA[1]	

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
		Minimum	Maximum	Minimum	Maximum	
Sulphate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Calcium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Magnesium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sodium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Potassium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Chloride	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Carbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Bicarbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Petroleum Hydrocarbons	ppb	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
pH	unit	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Rewan Formation						
Aluminium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	N/A
Antimony	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Arsenic	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Iron	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Molybdenum	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Mercury	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Selenium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Silver	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Dissolved Solids	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Electrical Conductivity	µS/cm	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sulphate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Calcium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Magnesium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sodium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Potassium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Chloride	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Carbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Bicarbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Petroleum Hydrocarbons	ppb	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
pH	unit	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Tertiary						
Aluminium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	N/A

Parameter	Unit	Contaminant Triggers		Contaminant Limits		Groundwater Level
		Minimum	Maximum	Minimum	Maximum	
Antimony	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Arsenic	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Iron	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Molybdenum	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Mercury	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Selenium	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Silver	µg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Dissolved Solids	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Electrical Conductivity	µS/cm	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sulphate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Calcium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Magnesium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Sodium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Potassium	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Chloride	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Carbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Bicarbonate	mg/L	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
Total Petroleum Hydrocarbons	ppb	TBA[1]	TBA[1]	TBA[1]	TBA[1]	
pH	unit	TBA[1]	TBA[1]	TBA[1]	TBA[1]	

[1] Limit and trigger to be determined based on a background monitoring program of representative groundwater samples from aquifers identified as potentially affected by mining activities, including at least 12 sampling events, (with sampling distribution to ensure sufficient samples are obtained in all seasons, and is submitted to the administering authority in accordance with condition C53. Triggers to be determined on 85th percentile of background. Limit to be determine based on 99th percentile of background.

C52 Contaminant triggers and contaminant limits as per *Table 14: Groundwater Quality Triggers and Limits* must be finalised and submitted to the administering authority prior to the commencement of mining activities.

C53 If quality characteristics of groundwater exceed any of the trigger levels stated in *Table 14: Groundwater quality triggers and limits* at any of the monitoring locations identified in *Figure 10: Groundwater Monitoring Locations*, the holder of this environmental authority must complete an investigation into the potential for environmental harm and notify the administering authority within 28 days of receiving the analysis results.

C54 Results of monitoring of groundwater must not exceed any of the limits defined in *Table 14: Groundwater quality triggers and limits*.

C55 Groundwater must not exceed any of the limits defined in *Table 14: Groundwater quality triggers and limits* at lease boundary.

C56 The construction, maintenance and management of 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.

C58 No impact to groundwater levels within the groundwater aquifers is to occur other than where authorised under an approval of the *Water Act 2000*.

Schedule D – Noise

D1 Noise from mining activities must not exceed the levels specified in *Table 15: Noise Limits – Mine Noise* when measured at a sensitive place.

Table 15: Noise Limits – Mine Noise

Noise Level dB(A) (outside)	Monday to Sunday		
	7am – 6pm	6pm – 10pm	10pm – 7am
$L_{Aeq, adj\ 15\ mins}$	45	35	33
$L_{A1, adj\ 15\ mins}$	55	50	40

Vibration

D2 Vibration from mining activities must not exceed the following levels when measured at any sensitive place:

(a) 10 mm/s for ground vibration of no more than 35 Hz; and

(b) 25 mm/s for ground vibration of more than 35 Hz.

Airblast Overpressure

D3 Airblast overpressure from mining activities must not exceed the following levels when measured at any sensitive place:

(a) 115 dB(Z) Peak for 4 out of 5 consecutive blasts; and

(b) 120 dB(Z) Peak for any single blasts.

Schedule E – Waste

Landfill

E1 General and regulated waste, other than tyres, must only be disposed of into the landfill facility located on ML70425 or removed from the site.
(Note: It is an offence under the Stock Act 1915 and subordinate legislation to allow or fail to take every reasonable measure to prevent stock access to animal matter or animal-contaminated matter)

E2 The landfill facility must be located within the area identified in Table 16: Landfill Facility (Waste Disposal).

Table 16: Landfill Facility (Waste Disposal)

Waste Disposal Facility Name	Latitude (Decimal Degree GDA94)	Longitude (Decimal Degree GDA94)
Landfill Facility	-23.0810	146.5078
	-23.0814	146.5095
	-23.0828	146.5073

Waste Disposal Facility Name	Latitude (Decimal Degree GDA94)	Longitude (Decimal Degree GDA94)
	-23.0832	146.5090

E3 Landfill gas must not exceed the following levels:

(a) 500 parts per million of methane at a height of 50mm above the final and intermediate cover surface including the batter slopes of the landfill facility;

(b) 25 percent of the lower explosive limit when measured in facility structures (but excluding facility structures used for landfill gas and leachate control and landfill gas and leachate recovery system components); and

(c) the lower explosive limit at the landfill facility boundary.

E4 Notwithstanding any condition of this approval, the following waste materials are not permitted or allowed to be deposited in the landfill unit:

(a) liquid or semi liquid waste other than liquid or semiliquid waste which has been produced in carrying out the environmentally relevant activity identified as Waste Disposal;

(b) hot ash;

(c) material that is smouldering or aflame;

(d) material containing a substance which is corrosive, reactive or toxic (other than materials containing a toxic substance from domestic premises) unless this material is to be deposited into a dedicated monocell approved in writing by the administering authority;

(e) all radioactive wastes, unless otherwise approved under the *Radiation Safety Act 1999* or contaminated soil;

(f) explosive(s); or

(g) ammunition, other than ammunition that no longer contains explosives, pyrotechnics or propellants apart from trace residues that are no longer capable of supporting combustion or an explosive reaction.

Tyres

E5 Scrap tyres are authorised to be stored awaiting disposal or disposed of on Mining Lease 70425 in a manner that minimises environmental harm.
(Note: For the disposal and storage of scrap tyres, reference to *Operational policy – Disposal and storage of scrap tyres at mine sites EM729* should be made)

Burning Waste

E6 Unless otherwise permitted by the conditions of this environmental authority, or with approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

E7 The holder of this environmental authority may burn vegetation, in accordance with condition E8, cleared in the course of carrying out resource activities provided the activity does not cause environmental harm at any sensitive place.

E8 Vegetation must not be burnt at the landfill facility.

Schedule F – Land

Rehabilitation

F1 Land disturbed by mining activities must be rehabilitated in accordance with *Appendix A: Rehabilitation Requirements* and *Figure A1: Rehabilitated Final Landform*.

F2 Rehabilitation must commence progressively as areas become available and in accordance with the Plan of Operations.

Infrastructure

F3 All buildings, structures, mining equipment and plant erected and/or used for the mining activities must be removed from the site prior to surrender, except where agreed in writing by the administering authority and the landowner.

Contaminants

F4 The mining activity must not result in a contaminant, other than a contaminant authorised to be released under condition **C2**, being deposited:

(a) in waters; or

(b) at another place, and in a way, so that the contaminant could reasonably be expected to wash, blow, fall or otherwise move into waters.

F5 The mining activity must not result in a contaminant, other than a contaminant authorised to be released under condition **C2** or meeting the requirements of condition **B1**, being deposited:

(a) off Mining Lease 70425; or

(b) at another place, and in a way, so that the contaminant could reasonably be expected to wash, blow, fall or otherwise move off Mining Lease 70425.

Mining Waste

F6 A Mining Waste Management Plan must be developed by an appropriately qualified and suitable person and implemented prior to the commencement of mining activities.

F7 The Mining Waste Management Plan must include:

(a) programs for progressive characterisation of overburden tailings and coarse reject waste prior to disposal for net acid producing potential and the following contaminants: Iron (Fe), Aluminium (Al), Copper (Cu), Magnesium (Mg), Manganese (Mn), Calcium (Ca), Sodium (Na) and Sulphate (SO4);

(b) identification of environmental issues and potential environmental impacts from the Overburden and CHPP waste;

(c) control measures for routine operations to minimise the likelihood of environmental harm;

(d) contingency plans and emergency procedures for non-routine situations;

(e) a program for monitoring and review of the effectiveness of the Mining Waste Management Plan.

(f) the process for the quantification of availability or leachability of metals from the tailings;

(g) the keeping of records of:

(i) disposal to indicate locations and characteristics of coarse reject waste disposed of within mining waste emplacement areas.

(ii) mining waste emplacements to indicate locations and characteristics of mining waste.

(h) placement strategies of tailings material within the Tailings Storage Facility;

(i) the progressive 3D survey of all tailings disposal locations within the mining waste emplacement areas;

(j) placement strategies of coarse reject waste in the mining waste emplacement area to enable successful rehabilitation outcomes in accordance with conditions of this environmental authority;

(k) the process for the identification and quantification of Potentially Acid Forming (PAF) mining waste;

(l) management actions for mining waste that has been identified as having a high availability or leachability of metals in accordance with condition F7c;

(m) management actions for mining waste that has been defined as Potentially Acid Forming (PAF), including a review of the potential impacts on rehabilitation;

(n) where the acid producing potential of mining waste material has not been conclusively determined, geochemical kinetic testing to indicate oxidation rates, potential reaction products and effectiveness of control strategies; and

(o) an overburden waste emplacement area operational plan in accordance with condition F13.

F8 The Mining Waste Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

(a) assess the plan against the requirements under condition F7;

(b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and

(c) identify any amendments made to the Mining Waste Management Plan following the review.

F9 The holder of this environmental authority must attach to the review report required by condition F8, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority holder on stated dates:

(a) to ensure compliance with this environmental authority; and

(b) to prevent a recurrence of any non-compliance issues identified.

F10 The review report required by condition F8 and the written response to the review report required by condition F9 must be submitted to the administering authority with

the subsequent annual return under the signature of the appointed signatory for the annual return.

F11 A copy of the Mining Waste Management Plan must be provided to the administering authority on request.

F12 The mining waste emplacement areas shall be designed to prevent environmental harm arising from contaminants being released to the environment.

F13 An operational plan must be developed and implemented prior to commencement of mining activities and maintained for the mining waste emplacement areas. The operational plan must include, but not be limited to:

(a) description of landform development stages of the mining waste emplacement areas;

(b) description of placement techniques for mining waste and course reject waste from the coal handling and processing plant;

(c) identification of areas that are, or are proposed, to contain Potentially Acid Forming mining waste emplacements;

(d) identification of areas that are, or are proposed, to contain coarse rejects within mining waste emplacements;

(e) identification of areas that are, or are proposed, to contain tailings within mining waste emplacements;

(f) demonstration of how operations of the mining waste emplacement areas are consistent with the accepted design plan for the facility; and

(g) decommissioning and rehabilitation strategies for the mining waste emplacement areas that demonstrate consistency with the conditions of this environmental authority.

F14 The mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste is appropriately confined and contained prior to decommissioning and rehabilitation.

F15 The disposal of all PAF coarse reject waste, identified by condition F7, must be encapsulated with Non Acid Forming (NAF) mining waste and disposed in a manner such that the coarse reject waste will not cause significant harm to the environment for the foreseeable future.

F16 All tailings must be disposed of within an authorised Tailings Storage Facility.

Subsidence

F17 A Subsidence Management Plan must be developed by an appropriately qualified person(s) and implemented by the holder of this environmental authority prior to the commencement of activities that result in subsidence.

F18 The Subsidence Management Plan must:

(a) provide for the proper and effective management of the actual and potential environmental impacts resulting from the mining activity and to ensure compliance with the conditions of this environmental authority;

(b) be developed in accordance with Appendix B;

(c) describe the proposed impacts of subsidence on any land, watercourse and floodplain including but not limited to:

(i) physical condition of surface drainage:

- erosion;
- areas susceptible to higher levels of erosion such as watercourse confluences;
- incision processes;
- stream widening;
- tension cracking;
- lowering of bed and banks;
- creation of instream waterholes;
- changes to local drainage patterns;

(ii) overland flow:

- capture of overland flow by subsided long-wall panels;
- increased overbank flows due to lowering of high bank of watercourses;
- the portion of local and large scale catchment likely to be captured by subsided long-wall panels and the associated impacts on downstream users;

(iii) water quality:

- surface water;
- groundwater;

(iv) land condition: current land condition to be impacted by subsidence;

(v) infrastructure: detail of existing infrastructure (pipelines, railway, powerlines and haul roads) should be identified where there is a potential impact from effects of land subsidence;

(d) propose options for mitigating any impacts associated with subsidence and how these mitigation methods will be implemented;

(e) describe cumulative impacts on watercourses or catchments;

(f) describe impacts on groundwater;

(g) describe contingency procedures for emergencies; and

(h) include a program for monitoring and review of the effectiveness of the Subsidence Management Plan

F19 The Subsidence Management Plan must be reviewed each calendar year and a report prepared by an appropriately qualified person. The report must:

(a) assess the plan against the requirements under condition F18;

(b) include recommended actions to ensure actual and potential environmental impacts are effectively managed for the coming year; and

(c) identify any amendments made to the Subsidence Management Plan following the review.

F20 The holder of this environmental authority must attach to the review report required by condition F19, a written response to the report and recommended actions, detailing the actions taken or to be taken by the environmental authority on stated dates:

(a) to ensure compliance with this environmental authority; and

(b) to prevent a recurrence of any non-compliance issues identified.

F21 The review report required by condition F19 and the written response to the review report required by condition F20 must be submitted to the administering authority upon request.

Annual Inspection of Subsidence

F22 The holder of this environmental authority must arrange for each subsided longwall panel to be inspected annually by a suitably qualified and experienced person, in accordance with conditions F23 through F25.

F23 The annual inspection must be conducted between 1 April and 1 November each year.

F24 At each annual inspection, the condition of each subsided longwall panel must be assessed, including the structural, geotechnical and hydraulic adequacy of the subsided longwall panel and the adequacy of the works with respect to the Subsidence Management Plan.

F25 For each inspection, copies of a report certified by the suitably qualified and experienced person, including any recommendations to ensure the integrity of each subsided longwall panel must be provided to the administering authority upon request.

Overland Flow

F26 The subsided longwall panels must not result in the capture of overland flow and must allow water to drain from the panel.

Ecological Equivalence Assessment

F27 The holder of this environmental authority must undertake an ecological equivalence assessment of the whole impact area – including opencut and all subsidence area where State Significant Biodiversity Values occur using the Ecological Equivalence Methodology (Queensland Biodiversity Offsets Policy) or an alternative method as agreed by the administering authority. The ecological equivalence assessment must:

(a) identify the presence, type and extent of any State Significant Biodiversity Values; and

(b) be undertaken by an appropriately qualified person.

Biodiversity Offset Plan

F28 A Biodiversity Offset Plan must be developed by an appropriately qualified person.

F29 The Biodiversity Offset Plan must:

(a) include the ecological equivalence assessment required under condition F27;

(b) identify and quantify impacts to any State Significant Biodiversity Values;

(c) provide for how potential impacts to State Significant Biodiversity Values will be assessed in accordance with the Queensland Biodiversity Offset Policy or an alternative approach approved by the administering authority;

(d) identify how the impacts of subsided areas will be monitored and identified to determine that sufficient offset areas have been provided in accordance with condition F41; and

(e) include a detailed description of how the Biodiversity Offset Plan aligns with the requirements for offsets imposed on the holder under the *Environmental Protection and Biodiversity Act 1999* (Cth).

F30 The Biodiversity Offset Plan described in condition F29 must be provided to the administering authority prior to the commencement of mining activities.

Biodiversity Offset Delivery Agreement

F31 A Biodiversity Offset Delivery Agreement must be developed by an appropriately qualified person.

F32 The Biodiversity Offset Delivery Agreement must:

(a) quantify the offset requirements and include a detailed description of the surveyed locations of State Significant Biodiversity Values, having regard to the assessment conducted under condition F27;

(b) describe if the holder of the environmental authority proposes to offset impacts to State Significant Biodiversity Values through:

1. a Legally Secured offset:

(i) Identify the land, (including the land on which the relevant mining activity is carried out) or on other land in the State which may have the relevant State Significant Biodiversity Values. Preferably the identified land should be located within areas mapped as priority 1 and 2 areas to provide for long term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP), however if land within this areas is not able to be utilised for offsets the Biodiversity Offset Delivery Agreement should identify why.

(ii) Include the completed assessment of the land to be provided for the offset including Ecological Equivalence Assessment; and/or

2. an offset payment:

(i) Indicate any commitment to make an offset payment in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, including the amount(s) and timing of that payment; and/or

(ii) Indicate the level of offset delivery for which an offset payment(s) may be considered; and/or

3. an offset transfer, indicate the level of offset delivery for which an offset transfer may be considered; and

(c) include details on the delivery of offsets as per conditions F34, F35 and F36.

F33 The Biodiversity Offset Delivery Agreement must be submitted to the administering authority by 3 years from grant of the Environmental Authority.

Offset Delivery

F34 The holder must provide a Legally Secured offset for any land identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy*, or an alternative approach approved by the administering authority, within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.

F35 The holder must provide any offset payment(s) identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.

F36 The holder must enter into an agreement with the administering authority to provide any offset transfer identified in condition F32 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority within 6 months of the administering authorities written approval of the Biodiversity Offset Delivery Agreement.

Legally Secured Offsets

F37 The holder must develop an Offset Area Management Plan for the land that is Legally Secured under condition F34 and/or F45 in the format specified by the administering authority.

F38 The Offset Area Management Plan required under condition F37 must contain the following information:

(a) the proposed management of land to ensure the environmental values of the land are maintained or enhanced;

(b) management and environmental objectives and outcomes, performance criteria and monitoring requirements;

(c) an analysis of the risks to achieve the objectives and outcomes;

(d) any restrictions imposed on the use of the offset area, including the management/control of weeds, cattle and site access;

(e) the activities that will be undertaken to achieve the objectives and outcomes, including the management/control of weeds, site access, erosion and sediment and fire management;

(f) a map that shows spatially the areas subject to the Offset Area Management Plan; and

(g) a reporting program.

F39 Land Legally Secured under condition F34 and/or F45 must be managed in accordance with the Offset Area Management Plan for each stage for a period of 20 years unless otherwise approved.

Offset Transfers

F40 The holder of the environmental authority must comply with the requirements of any agreement under condition F36 and/or F47.

Review of the Biodiversity Offset Plan and Biodiversity Offset Delivery Agreement

F41 The Biodiversity Offset Plan and the Biodiversity Offset Delivery Agreement must be reviewed by May of every fifth year from the grant of the environmental authority and a report prepared by an appropriately qualified person. The report must:

(a) assess the area of state significant biodiversity values proposed to be impacted by the mining activities; and

(b) identify the actual areas of state significant biodiversity values impacted by the mining activities.

F42 Where the actual areas of disturbance to state significant biodiversity values is identified as greater than the proposed area of disturbance as per condition F41, the holder of the environmental authority must develop a supplementary Biodiversity Offset Delivery Agreement.

Supplementary Biodiversity Offset Delivery Agreement

F43 The Supplementary Biodiversity Offset Delivery Agreement must:

(a) quantify the offset requirements and include a detailed description of the surveyed locations of State Significant Biodiversity Values, having regard to the assessment conducted under condition F27 and the additional actual impact area identified under condition F41 (additional to the proposed impacts identified within the Biodiversity Offset Plan and previously offset under the Biodiversity Offset Delivery Agreement);

(b) if the holder of the environmental authority proposes to offset the additional impacts to State Significant Biodiversity Values through:

1. a Legally Secured offset:

(i) identify the land, (including the land on which the relevant mining activity is carried out) or on other land in the State which may have the relevant State Significant Biodiversity Values. Preferably the identified land should be located within areas mapped as priority 1 and 2 areas to provide for long term landscape scale ecosystem function and connectivity consistent with the Galilee Basin Offset Strategy (2012 EHP), however if land within this areas is not able to be utilised for offsets the Biodiversity Offset Delivery Agreement should identify why.

(ii) Include the completed assessment of the land to be provided for the offset including Ecological Equivalence Assessment; and/or

2. an offset payment:

(i) Indicate any commitment to make an offset payment in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority, including the amount(s) and timing of that payment; and/or

(ii) indicate the level of offset delivery for which an offset payment(s) may be considered; and/or

3. an offset transfer, indicate the level of offset delivery for which an offset transfer may be considered; and

(c) include details on the delivery of offsets as per conditions F45, F46 and F47.

F44 The Supplementary Biodiversity Offset Delivery Agreement must be submitted to the administering authority within 3 months of the completed date of the review report required under condition F41.

Supplementary Offset Delivery

F45 The holder must provide a Legally Secured offset for any land identified in condition F43 in accordance with the *Queensland Biodiversity Offset Policy,* or an alternative approach approved by the administering authority, within 12 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

F46 The holder must provide any offset payment(s) identified in condition F43 in accordance with the Queensland Biodiversity Offset Policy or an alternative approach approved by the administering authority, within 4 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

F47 The holder must enter into an agreement with the administering authority to provide any offset transfer identified in condition F43 in accordance with the *Queensland Biodiversity Offset Policy* or an alternative approach approved by the administering authority within 12 months of the submission of the Supplementary Biodiversity Offset Delivery Agreement.

Schedule G – Regulated Structures

G1 The hazard category of any structure must be assessed by a suitably qualified and experienced person:

(a) in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*; and

(b) in any of the following situations:

(i) prior to the design and construction of the structure; or

(ii) prior to any change in its purpose or the nature of its stored contents; and

(iii) in accordance with the *Manual for assessing Hazard Categories and Hydraulic Performance of Dams.*

G2 A hazard assessment report and certification must be prepared for any structure assessed and the report may include a hazard assessment for more than one structure.

G3 The holder must, on receipt of a hazard assessment report and certification, provide to the administering authority one paper copy and one electronic copy of the hazard assessment report and certification.

G4 Certification must be provided by the suitably qualified and experienced person who undertook the assessment, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

G5 The holder must take reasonable and practical measures so that each dam associated with the mining activity is designed, constructed, operated and maintained in accordance with accepted engineering standards and is fit for the purpose for which it is intended.

G6 All regulated structures must be designed by, and constructed under the supervision of, a suitably qualified and experienced person in accordance with the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

G7 Construction of a regulated structure is prohibited unless the holder has:

(a) submitted a hazard category assessment report and certification to the administering authority;

(b) commissioned a suitably qualified and experienced person to prepare a design plan for the structure; and

(c) received the certification from a suitably qualified and experienced person for the design and design plan and the associated operating procedures in compliance with the relevant condition of this authority.

G8 Certification must be provided by the suitably qualified and experienced person who oversees the preparation of the design plan, in the form set out in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*.

G9 Regulated structures must:

(a) be designed and constructed in accordance with and conform to the requirements of the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*;

(b) be designed and constructed with due consideration given to ensuring that the design integrity would not be compromised on account of:

(i) floodwaters from entering the regulated dam from any watercourse or drainage line; and

(ii) wall failure due to erosion by floodwaters arising from any watercourse or drainage line.

G10 The design plan for a regulated structure must include, but is not limited to:

(a) certification that the design plan:

(i) is in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*, including subsidiary certifications if necessary; and

(ii) addresses the requirements in G10(b) to (h)

(b) A design report which provides:

(i) a description of all the documents which constitute the design plan;

(ii) a statement of:

A. the applicable standards including engineering criteria, industry guidelines, relevant legislation and regulatory documents, relied upon in preparing the design plan; and

B. all relevant facts and data used in preparing the design plan, including any efforts made to obtain necessary facts and data, and any limitations or assumptions to facts and data used in preparing the design plan;

C. the hazard category of the regulated structure; and

D. setting out the reasoning of the suitably qualified and experienced person who has certified the design plan, as to how the design plan provides the necessary required performance;

(iii) documentation of hydrological analyses and estimates required to determine all elements of the design including volumes and flow capacities;

(iv) detailed criteria for the design, operation, maintenance and decommissioning of the regulated structure, including any assumptions;

(v) design, specification and operational rules for any related structures and systems used to prevent failure scenarios;

(c) Drawings showing the lines and dimensions, and locations of built structures and land forms associated with the regulated structure;

(d) Consideration of the interaction of the pit design with the levee or regulated dam design;

(e) An operational plan that includes:

(i) normal operating procedures and rules (including clear documentation and definition of process inputs) used in calculating the Design Storage Allowance (DSA));

(ii) contingency and emergency action plans including operating procedures designed to avoid and/or minimise environmental impacts including threats to human life resulting from any overtopping or loss of structural integrity of the regulated structure;

(f) A plan for the decommissioning and rehabilitation of the regulated structure at the end of its operational life;

(g) Details of reports on investigations and studies done in support of the design plan;

(h) Any other matter required by the suitably qualified and experienced person.

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

(a) the 'as constructed' drawings and specifications meet the original intent of the design plan for that regulated structure;

(b) construction of the regulated structure is in accordance with the design plan;

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

G13 The system design plan must contain:

(a) the design plans, and

(b) the ‘as constructed’ plans, and

(c) the operational rules for each individual regulated dam that forms part of the integrated system, and

(d) the standards of serviceability and accessibility of water transfer equipment or structures, and

(e) the operational rules for the system as a whole.

Operation of a Regulated Structure

G14 Operation of a regulated structure is prohibited unless:

(a) the holder has submitted to the administering authority:

(i) one paper copy and one electronic copy of the design plan and certification of the ‘design plan’ in accordance with condition G7, and

(ii) a set of ‘as constructed’ drawings and specifications, and

(iii) certification of those ‘as constructed drawings and specifications’ in accordance with condition G8, and

(iv) where the regulated structure is to be managed as part of an integrated containment system for the purpose of sharing the DSA volume across the system, a copy of the certified system design plan.

(b) the requirements of this authority relating to the construction of the regulated structure have been met; and

(c) relevant details for regulated structures have been included in Table 17: Location of Regulated Structures and Table 18: Basic Details of Regulated Dams of this authority.

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

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

(a) the secure use of fencing, bunding or screening; and

(b) escape arrangements for trapped livestock and fauna.

Mandatory Reporting Level

G17 The Mandatory Reporting Level (the MRL) must be marked on a regulated dam in such a way that during routine inspections of that dam, it is clearly observable.

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

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

Annual Inspection Report

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

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

(a) against the most recent hazard assessment report and design plan (or system design plan);

(b) against recommendations contained in previous annual inspections reports;

(c) against recognised dam safety deficiency indicators;

(d) for changes in circumstances potentially leading to a change in hazard category;

(e) for conformance with the conditions of this authority;

(f) for conformance with the 'as constructed' drawings;

(g) for the adequacy of the available storage in each regulated dam, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of the containment barrier and the level of liquids in the dam (or network of linked containment systems);

(h) for evidence of conformance with the current operational plan.

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

G23 The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*. (Feb 2012)

G24 The holder of this environmental authority must:

(a) upon receipt of the annual inspection report, consider the report and its recommendations and take action to ensure that the regulated structure will safely perform its intended function; and

(b) within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.

G25 A copy of the annual inspection report must be provided to the administering authority upon request and within ten (10) business days of receiving a request from the administering authority under this condition.

Design Storage Allowance

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

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

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

Performance Review

G29 The holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of

the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.

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

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

Transfer Arrangements

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

Decommissioning and Rehabilitation

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

(a) ongoing environmental harm is minimised by the regulated structure:

(i) becoming a safe site for humans and animals at the completion of rehabilitation; and

(ii) becoming a stable landform, that no longer contains flowable substances and minimises erosion impacts; and

(iii) not allowing for acid mine drainage; and

(iv) being approved or authorised under relevant legislation for a beneficial use; and

(v) being a void authorised by the administering authority to remain after decommissioning; and

(b) the regulated structure is compliant with all other relevant rehabilitation requirements of this authority.

Regulated Structures Location and Performance

G33 Each regulated structure named in Column 1, *Table 17: Location of Regulated Structures* must be wholly located within the control points noted in columns 2 and 3 of *Table 17: Location of Regulated Structures*, for that structure.

G34 Each regulated dam named in Column 1 of *Table 17: Location of Regulated Structures*, must be consistent with the details noted in Column 2 through to and including Column 7 of *Table 18: Basic Details of Regulated Dams*, below, for that dam.

G35 Spillway Level (mAHD) to be finalised based on final design plans and submitted to the administering authority 20 business days prior to commencement of construction of the regulated structure.

G36 Each regulated dam named in Column 1 of *Table 17: Location of Regulated Structures*, must meet the hydraulic performance criteria noted in Column 2 through to and including Column 4 of *Table 19: Hydraulic Performance of Regulated Dams*, for that dam.

G37 Each regulated levee named in Column 1 of *Table 17: Location of Regulated Structures*, must be consistent with the details noted in Columns 2 through to and including Column 6 of *Table 20: Basic Details of Regulated Levees*, for that levee.

G38 Design Flood Level (mAHD) and minimum Levee Level (mAHD) to be finalised based on final design plans and submitted to the administering authority 20 business days prior to commencement of construction of the regulated structure.

Table 17: Location of Regulated Structures

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure1	**Latitude (decimal degree GDA 94)**	**Longitude (decimal degree GDA 94)**	**Unique Location ID3**
Mine Water Dam 1	-23.0563	146.4087	N/A
	-23.0715	146.4086	
	-23.0715	146.4354	
	-23.0564	146.4354	
Mine Water Dam 2	-23.0715	146.5242	N/A
	-23.0850	146.5241	
	-23.0851	146.5398	
	-23.0715	146.5398	
Mine Water Dam 3	-23.0844	146.5040	N/A
	-23.0928	146.5040	
	-23.0929	146.5165	
	-23.0845	146.5165	
Mine Water Dam 4	-23.0988	146.5097	N/A
	-23.1076	146.5096	
	-23.1076	146.5195	
	-23.0988	146.5195	
Tailings Storage Facility 1	-23.0153	146.4731	N/A
	-23.0071	146.4876	
	-23.0156	146.4931	
	-23.0238	146.4786	
Tailings Storage Facility 2	-23.0243	146.4778	N/A
	-23.0125	146.4987	
	-23.0159	146.5024	
	-23.0219	146.5045	

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure1	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID3
	-23.0253	146.5045	
	-23.0322	146.5017	
	-23.0431	146.4875	
	-23.0438	146.4840	
Southern Opencut Levee	-23.1172	146.4416	Control Point 1
	-23.1099	146.4419	Control Point 2
	-23.1099	146.4954	Control Point 3
	-23.0698	146.4955	Control Point 4
	-23.0577	146.4968	Control Point 5
	-23.0539	146.4938	Control Point 6
	-23.0527	146.4900	Control Point 7
	-23.0532	146.4844	Control Point 8
	-23.0517	146.4794	Control Point 9
	-23.0496	146.4743	Control Point 10
Northern Opencut Levee	-23.0323	146.4669	Control Point 11
	-23.0384	146.4696	Control Point 12
	-23.0409	146.4735	Control Point 13
	-23.0422	146.4786	Control Point 14
	-23.0451	146.4834	Control Point 15
	-23.0468	146.4858	Control Point 16
	-23.0470	146.4905	Control Point 17
	-23.0437	146.4986	Control Point 18
	-23.0380	146.5045	Control Point 19
	-23.0304	146.5039	Control Point 20
	-23.0237	146.5054	Control Point 21
	-23.0154	146.5031	Control Point 22
	-23.0125	146.5000	Control Point 23
Stockpile Levee	-23.0585	146.5046	Control Point 24
	-23.0561	146.5057	Control Point 25
	-23.0547	146.5086	Control Point 26
	-23.0609	146.5129	Control Point 27
	-23.0631	146.5154	Control Point 28
Spoil Dam 1	-23.0100	146.5012	N/A
	-23.0100	146.4991	
	-23.0062	146.4991	

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure1	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID3
	-23.0063	146.5012	
Spoil Dam 2	-23.0437	146.4850	N/A
	-23.0437	146.4889	
	-23.0455	146.4889	
	-23.0455	146.4850	
Spoil Dam 3	-23.0326	146.4683	N/A
	-23.0326	146.4724	
	-23.0346	146.4724	
	-23.0345	146.4683	
Spoil Dam 4	-23.0985	146.4924	N/A
	-23.0985	146.4940	
	-23.0952	146.4940	
	-23.0952	146.4924	
Borefield Dam 1	-23.0986	146.4258	N/A
	-23.1005	146.4258	
	-23.1005	146.4272	
	-23.0986	146.4272	
Borefield Dam 2	-23.1190	146.4257	N/A
	-23.1210	146.4257	
	-23.1210	146.4271	
	-23.1190	146.4271	
Adit/ROM Dam South	-23.1523	146.4391	N/A
	-23.1523	146.4408	
	-23.1490	146.4408	
	-23.1490	146.4392	
	-23.0612	146.4853	
	-23.0625	146.4853	
	-23.0625	146.4874	
TLO Dam	-23.0648	146.5177	N/A
	-23.0671	146.5158	
	-23.0662	146.5145	
	-23.0638	146.5164	
CMIA Dam and Overflow Basin	-23.0582	146.4964	N/A
	-23.0549	146.4953	
	-23.0531	146.4917	

Column 1	Column 2	Column 3	Column 4 Levees only
Name of Regulated Structure1	Latitude (decimal degree GDA 94)	Longitude (decimal degree GDA 94)	Unique Location ID3
	-23.0528	146.4897	
	-23.0540	146.4896	
	-23.0553	146.4945	
	-23.0583	146.4947	
Process Water and Decant Dam	-23.0399	146.4760	N/A
	-23.0398	146.4729	
	-23.0383	146.4729	
	-23.0383	146.4760	
Pit Dewatering Dam North	-23.0369	146.4755	N/A
	-23.0368	146.4724	
	-23.0353	146.4724	
	-23.0353	146.4755	
Pit Dewatering Dam South	-23.0825	146.4612	N/A
	-23.0825	146.4648	
	-23.0809	146.4648	
	-23.0809	146.4612	
Little Sandy & Rocky Creek Diversion	-23.0715	146.4260	N/A
	-23.1169	146.4258	
	-23.1170	146.4364	
	-23.0716	146.4366	

[1] The 'name of the regulated structure' should refer to the name for example, process residue facility and decant dam.

[2] A minimum of three control points is required to constrain the location of all activities associated with the regulated structure. Additional infrastructure which forms part of any regulated dam may include appurtenant works consisting of seepage collections systems, runoff diversion bunds, containment systems, pressure relief wells, decant and recycle water systems. Note that details on tailing discharge pipelines would be included in this table only if they have not been included in the design plan required in condition G10.

[3]This location reference is the reference for *Table 17: Location of Regulated Structures* flood level and crest level.

Table 18: Basic Details of Regulated Dams

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam[1]	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam[2] at spillway (m)	Spillway Level (mAHD)	Use of dam[3]
Mine Water Dam 1	High	204.93 @ FSL	9300 @ FSL	14.5 @ FSL	327	Primary containment of MAW from 3 underground mines, central open-cut pit dewatering dam and spoil dam 4, and pumped transfers from 2 GW dewatering dams. Supply point for distribution of MAW to project consumptive demands
Mine Water Dam 2	High	137.68 @ FSL	7600 @ FSL	13.5 @ FSL	319	Containment of MAW from TLO/ product stockpile and CMIA dams, northern open-cut pit dewatering dam and spoil dam 3. Supply point for distribution of MAW to project consumptive demands
Mine Water Dam 3	High	56.38 @ FSL	2550 @ FSL	11.5 @ FSL	311.9	Auxiliary storage in the event that insufficient storage is available within MWD1 and MWD 2
Mine Water Dam 4	High	27.71 @ FSL	830 @ FSL	9.0 @ FSL	308	Auxiliary storage in the event that insufficient storage is available within MWD1,MWD 2 and MWD3.
Tailings Storage Facility	High	128.17 @ FSL	10850@ FSL	12.6 @ FSL	306.7	Storage of tailings generated from the mine
Spoil Dam 1	High	5.5 @ FSL	300@ FSL	6.8 @ FSL	TBD[4]	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 2	High	6.1 @ FSL	350@ FSL	6.8 @ FSL	TBD[4]	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 3	High	6.9 @ FSL	400@ FSL	7.0 @ FSL	TBD[4]	Collection of mine affected runoff from northern open-cut pit/ Tailings Storage Facility 1
Spoil Dam 4	High	17.0 @ FSL	1,200@ FSL	8.3 @ FSL	TBD[4]	Collection of mine affected runoff from central open-cut pit
Borefield Dam 1	High	42.8 @ FSL	55@ FSL	6.0 @ FSL	TBD[4]	Aggregation of all flows generated from groundwater dewatering

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam[1]	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam[2] at spillway (m)	Spillway Level (mAHD)	Use of dam[3]
Borefield Dam 2	High	42.8 @ FSL	55@ FSL	6.0 @ FSL	TBD[4]	Aggregation of all flows generated from groundwater dewatering and transfer to Mine Water Dam 1 for subsequent re-use.
Adit/ROM Dam south	High	0.9 @ FSL	29@ FSL	6.4 @ FSL	TBD[4]	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
TLO Dam	Significant	1.3 @ FSL	45@ FSL	4.6 @ FSL	TBD[4]	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
CMIA Dam & Overflow Basin	Significant	5.3 @ FSL	280@ FSL	6.4 @ FSL	TBD[4]	Components of the process area runoff system that diverts all clean runoff around process areas, contains and diverts all process area mine affected runoff into collection dams, and transfers all MAW into MWDs for subsequent reuse
Process Water and Decant Dam	High	2.9 @ FSL	150@ FSL	6.8 @ FSL	TBD[4]	Primary supply dam for CHPP process water (process and tailings), and receipt of tailings decant water from both TSF1 and 2.
Pit Dewatering Dam North	High	7.7 @ FSL	200@ FSL	7.0 @ FSL	TBD[4]	Containment of all mine affected runoff within open-cut pits, transfer of MAW from open-pit collection points to open-cut dewatering dams, and transfer of MAW from dewatering dams into one of MWDs for subsequent use

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Name of Regulated dam[1]	Hazard Category	Surface area of dam at spillway (ha)	Max. volume of dam at spillway (ML)	Max. depth of dam[2] at spillway (m)	Spillway Level (mAHD)	Use of dam[3]
Pit Dewatering Dam South	High	3.7 @ FSL	450@ FSL	7.0 @ FSL	TBD[4]	Containment of all mine affected runoff within open-cut pits, transfer of MAW from open-pit collection points to open-cut dewatering dams, and transfer of MAW from dewatering dams into one of MWDs for subsequent use

[1] The name of the regulated dam should refer to the name of the dam, for example, process residue facility and decant dam and should be the same name used in *Table 28: Location of Regulated Structures* for the dam.
[2] For regulated dams which do not require a dam wall, input the maximum void depth, for example, where dams are formed by excavating below the land surface or backfilling a residual void.
[3] The use or purpose of the regulated dam should outline the designed function, for example, "the permanent containment of tailings resulting from the extraction of nickel, cobalt and other metals at the XYZ refinery".

Table 19: Hydraulic Performance of Regulated Dams

Column 1	Column 2	Column 3	Column 4
Name of Regulated dam	Spillway Capacity AEP	Design Storage Allowance AEP	Mandatory Reporting Level AEP
Mine Water dam 1	1:100,000	1:100 AEP 3 month wet season	323.2m AHD
Mine Water Dam 2	1:100,000	1:100 AEP 3 month wet season	316.3m AHD
Mine Water Dam 3	1:100,000	1:100 AEP 3 month wet season	306.7m AHD
Mine Water Dam 4	1:100,000	1:100 AEP 3 month wet season	305.1m AHD
Tailings Storage Facility 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Tailings Storage Facility 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 3	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Spoil Dam 4	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Borefield Dam 1	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm

Borefield Dam 2	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Adit/ROM dam South	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
TLO dam	1:1,000	1:20 AEP 3 month wet season	1:10 AEP 72 hour storm
CMIA Dam & Overflow Basin	1:1,000	1:20 AEP 3 month wet season	1:10 AEP 72 hour storm
Process Water and Decant Dam	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Pit Dewatering Dam north	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm
Pit Dewatering Dam South	1:100,000	1:100 AEP 3 month wet season	1:100 AEP 72 hour storm

Table 20: Basic Details of Regulated Levees

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Name of Regulated Levee	**Design AEP**	**Design Flood Level1 (mAHD)**	**Minimum Levee Level1 (mAHD)**	**Schedule D Table 1 Location ID1**	**Use of levee**
Southern Opencut Levee	1:1000	TBA[2]	TBA[2]	Control Point 1	Provides regional flood immunity to the Southern Open-Cut pit and CMIA from Sandy and Well Creeks
				Control Point 2	
				Control Point 3	
				Control Point 4	
				Control Point 5	
				Control Point 6	
				Control Point 7	
				Control Point 8	
				Control Point 9	
				Control Point 10	
Northern Opencut Levee	1:1000	TBA[2]	TBA[2]	Control Point 11	Provides regional flood immunity to the Northern Open-Cut pit from Sandy and Well Creeks
				Control Point 12	
				Control Point 13	
				Control Point 14	
				Control Point 15	
				Control Point 16	
				Control Point 17	
				Control Point 18	
				Control Point 19	
				Control Point 20	
				Control Point 21	
				Control Point 22	
				Control Point 23	
Stockpile Levee	1:1000	TBA[2]	TBA[2]	Control Point 24	Provides regional flood immunity to the product stockpile from sandy Creek
				Control Point 25	
				Control Point 26	
				Control Point 27	
				Control Point 28	

[1] Design flood levels, and hence regulated levee levels, are expected to vary along the length of that levee. The location IDs listed (Column 5) must correspond with location IDs listed in *Table 27: Location of Regulated Structures* and, together with Columns 3 and 4, define the minimum design level envelope for the longitudinal crest of the structure.

[2] To be provided by proponent prior to finalising the draft EA.

Schedule H – Sewage Treatment

H1 Treated effluent from the sewage treatment plant must only be discharged from the authorised discharge points, as specified in *Table 21: Effluent Discharge Locations* and discharged to the areas shown in *Table 23: Effluent Irrigation Locations* or used for dust suppression, in compliance with the limits and at the frequency stated in *Table 22: Effluent Release Limits to Land* and the conditions of this authority.

Table 21: Effluent Discharge Locations

Authorised Discharge Point	Sewage Treatment Plant	Location	Effluent Irrigation Area	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Effluent Discharge Point 1	Permanent Treatment Plant	Light Industrial Area	Effluent Irrigation Area 1	-23.0593	146.5505
Effluent Discharge Point 2	Temporary Treatment Plant Central Mine Infrastructure Area	Central Mine Infrastructure Area	Effluent Irrigation Area 2	-23.0923	146.4433
Effluent Discharge Point 3	Temporary Treatment Plan Coal Handling and Preparation Area	Coal Handling and Preparation Area	Effluent Irrigation Area 3	-23.0596	146.4903
Effluent Discharge Point 4	Temporary Treatment Plan accommodation Centre	Temporary Accommodation Centre	Effluent Irrigation Area 4	-23.0928	146.5628

Table 22: Effluent Release Limits to Land

Quality Characteristic	Release Limit			Frequency
	Minimum	Median	Maximum	
5 day Biological oxygen demand (mg/L)		20		Monthly
Suspended Solids (mg/L)		5		Monthly
Thermotolerant coliforms (Cfu/100mL^2)		10		Weekly
Total phosphorus (mg/L)			15	Monthly
Total nitrogen (mg/L)			30	Monthly
Electrical Conductivity (µS/cm)		1600		Monthly
pH (pH units)	6.0		8.5	Monthly

Table 23: Effluent Irrigation Locations

Authorised Discharge Point	Effluent Irrigation Area	Location	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)
Effluent Discharge Point 1	Effluent Irrigation Area 1	East side of Light Industrial Area next to Airport road	-23.0687	146.5670
			-23.0687	146.5726
			-23.0733	146.5726
			-23.0733	146.5670
Effluent Discharge Point 2	Effluent Irrigation Area 1	North side of Central Mine Industrial Area	-23.0913	146.4432
			-23.0913	146.4440
			-23.0918	146.4440
			-23.0917	146.4432
Effluent Discharge Point 3	Effluent Irrigation Area 1	West side of Coal Handling an Preparation Plant Industrial Area	-23.0593	146.4896
			-23.0593	146.4901
			-23.0606	146.4901
			-23.0606	146.4896
Effluent Discharge Point 4	Effluent Irrigation Area 1	West side of temporary accommodation Area	-23.0921	146.5619
			-23.0933	146.5619
			-23.0933	146.5625
			-23.0921	146.5626

H2 Subject to condition H1, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.

H3 Treated effluent must not be released from the site to any waters or the bed and banks of any waters.

H4 Water or storm water contaminated by sewage treatment activities must not be released to any waters or the bed and banks of any waters.

Land Disposal

H5 The application of treated effluent to land must be carried out in a manner such that:

(a) vegetation is not damaged;

(b) there is no surface ponding of effluent; and

(c) there is no run-off of effluent.

H6 If areas irrigated with effluent are accessible to employees or the general public, prominent signage must be provided advising that effluent is in use and care should be taken to avoid consuming or otherwise coming into unprotected contact with the effluent.

H7 All sewage effluent release to land must be monitored at the frequency and for the parameters specified in *Table 22: Effluent Release Limits to Land*.

H8 The daily volume of effluent released to land must be measured and records kept of the volumes of effluent released.

H9 When circumstances prevent the irrigation of treated sewage effluent such as during or following rain events, water must be directed to a wet-weather storage or alternative measures must be taken to store/lawfully dispose of effluent.

H10 Treated sewage effluent must only be supplied to another person or organisation that has a written plan detailing how the user of the treated sewage effluent will comply with their general environmental duty under section 319 of the *Environmental Protection Act 1994* whilst using the treated sewage effluent.

Schedule I – Water Treatment

I1 Brine and any contaminated water generated from the water treatment plant must only be released from the authorised discharge points specified in *Table 24: Brine Water Management Infrastructure* to the water management infrastructure specified in *Table 24: Brine Water Management Infrastructure*.

Table 24: Brine Water Management Infrastructure

Discharge Point	Latitude (decimal degree GDA94)	Longitude (decimal degree GDA94)	Water Management Infrastructure
Brine Discharge Point 1	-23.08180	146.55214	MWD 2

Schedule J – Figures

Figure 1: Overall Site Layout Domain Plan

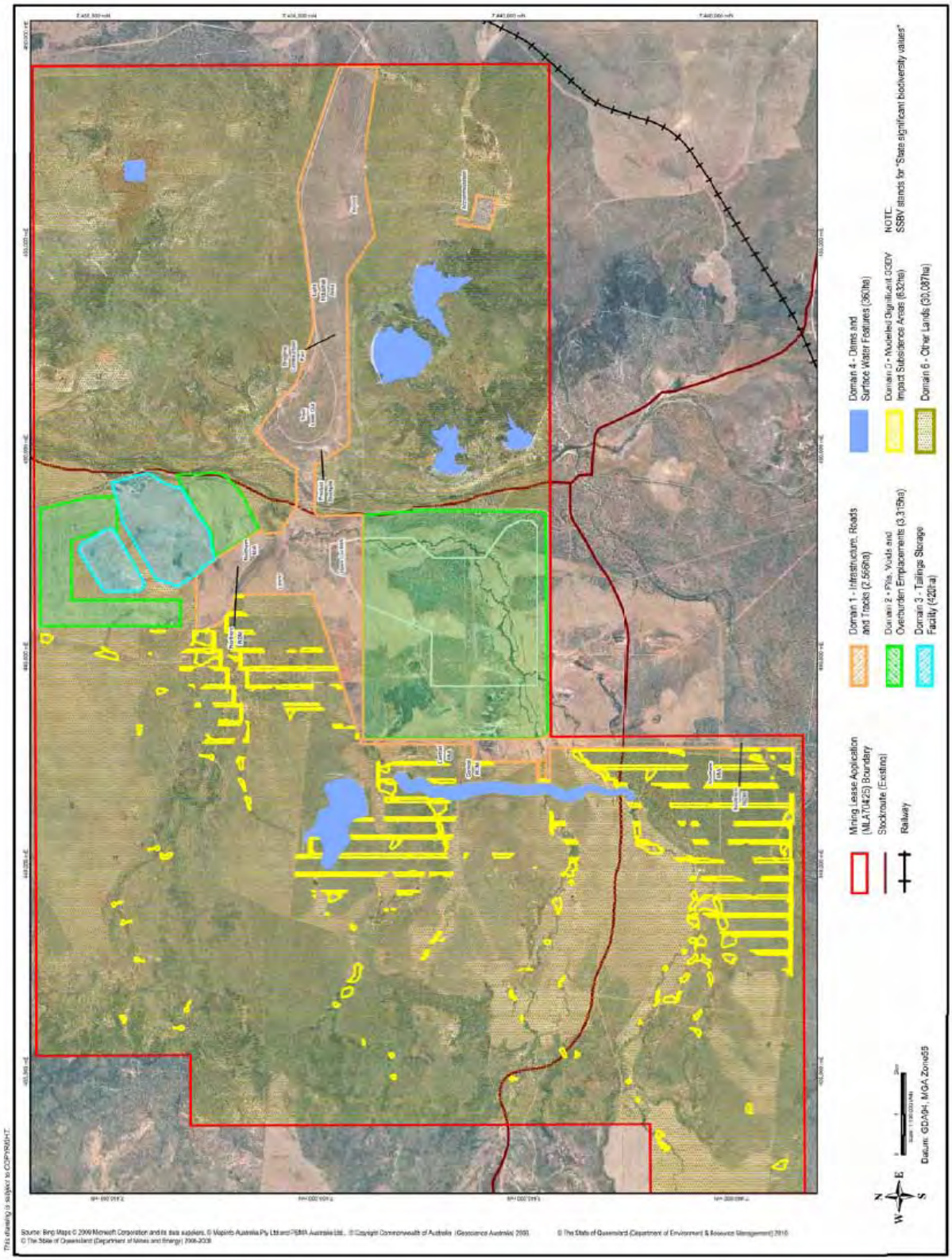


Figure 2: Site Layout showing Domain 1

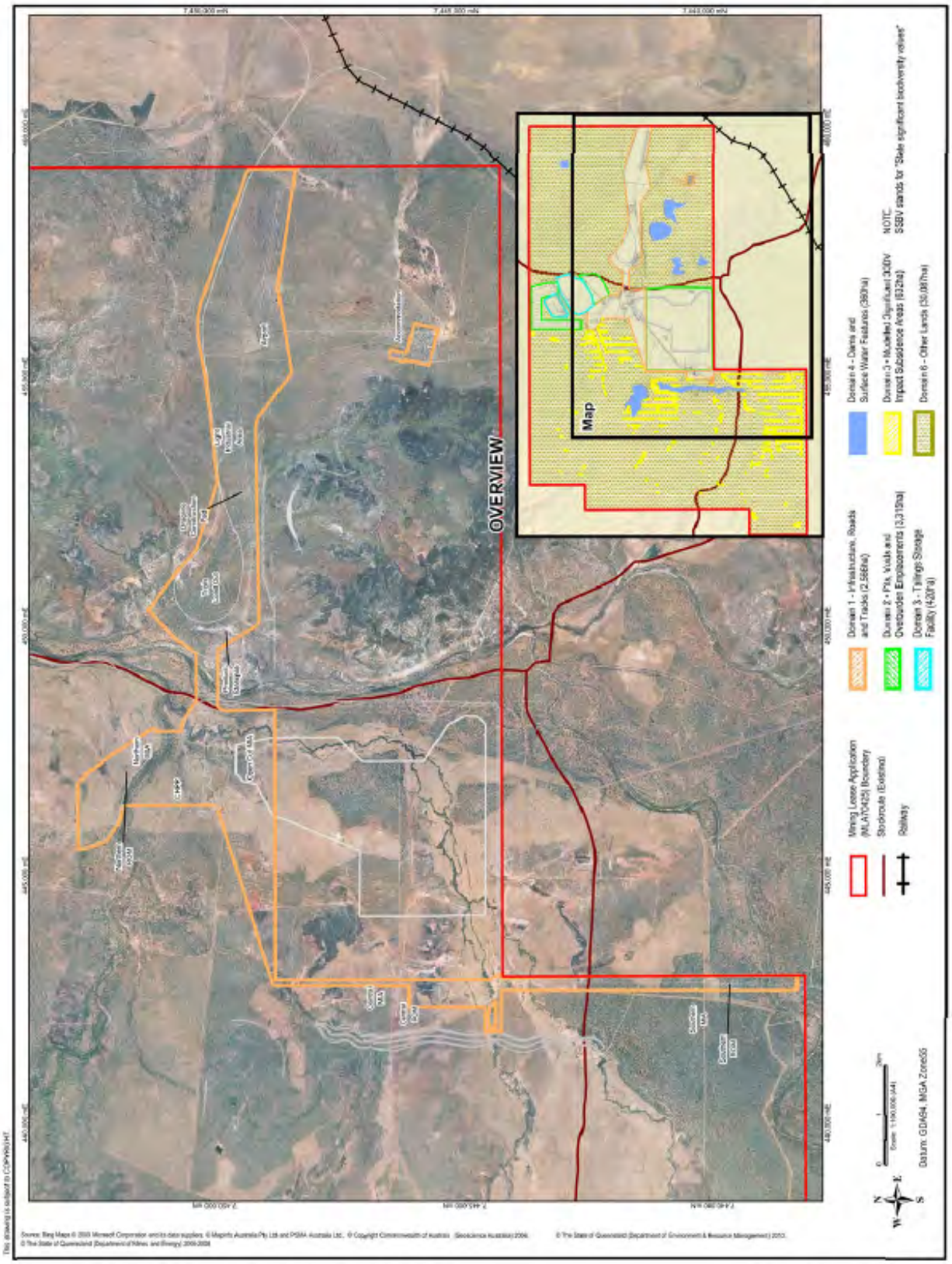
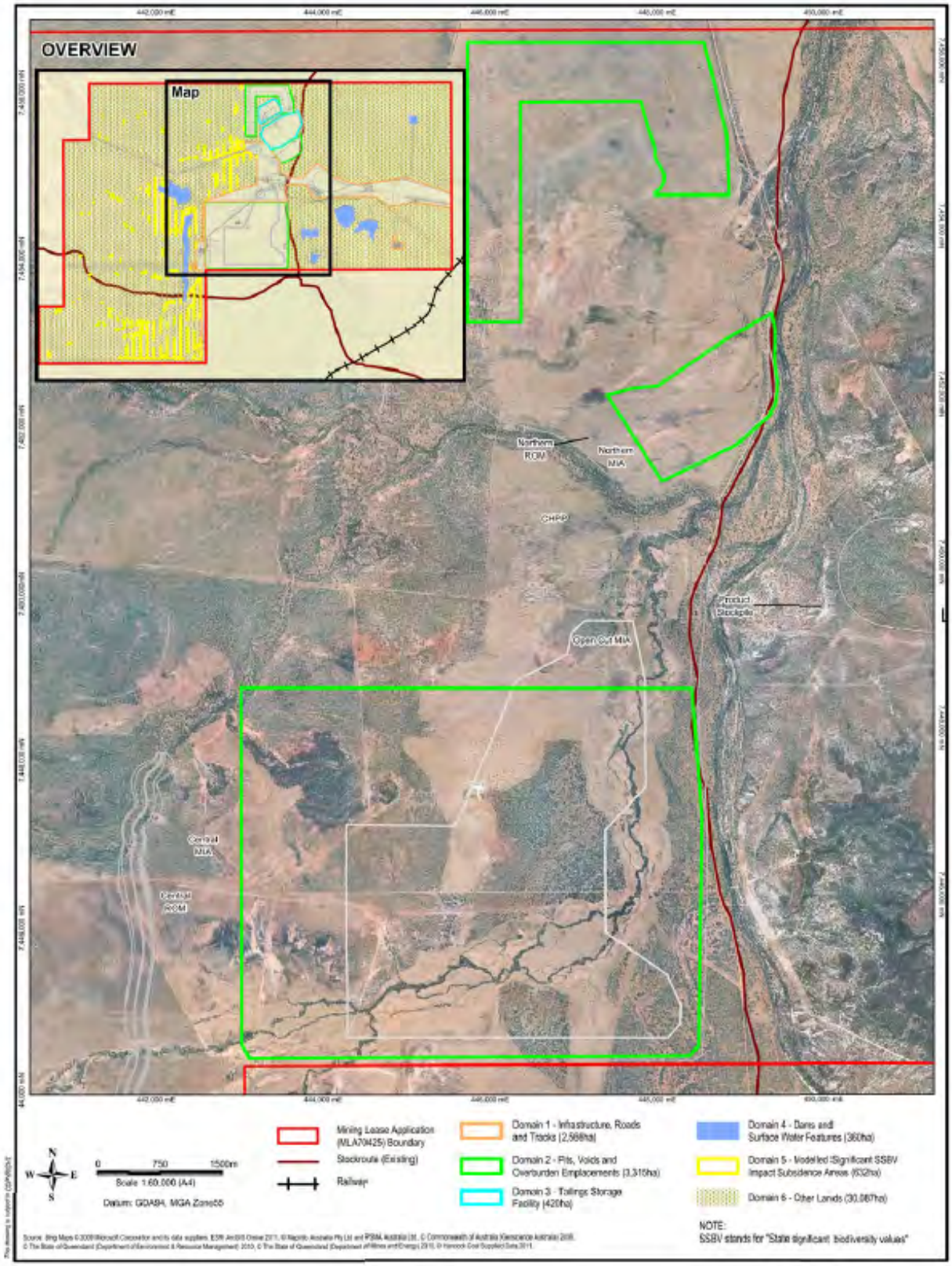


Figure 3: Site Layout showing Domain 2



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SITE LAYOUT SHOWING DOMAIN 2

Figure 4: Site Layout showing Domain 3

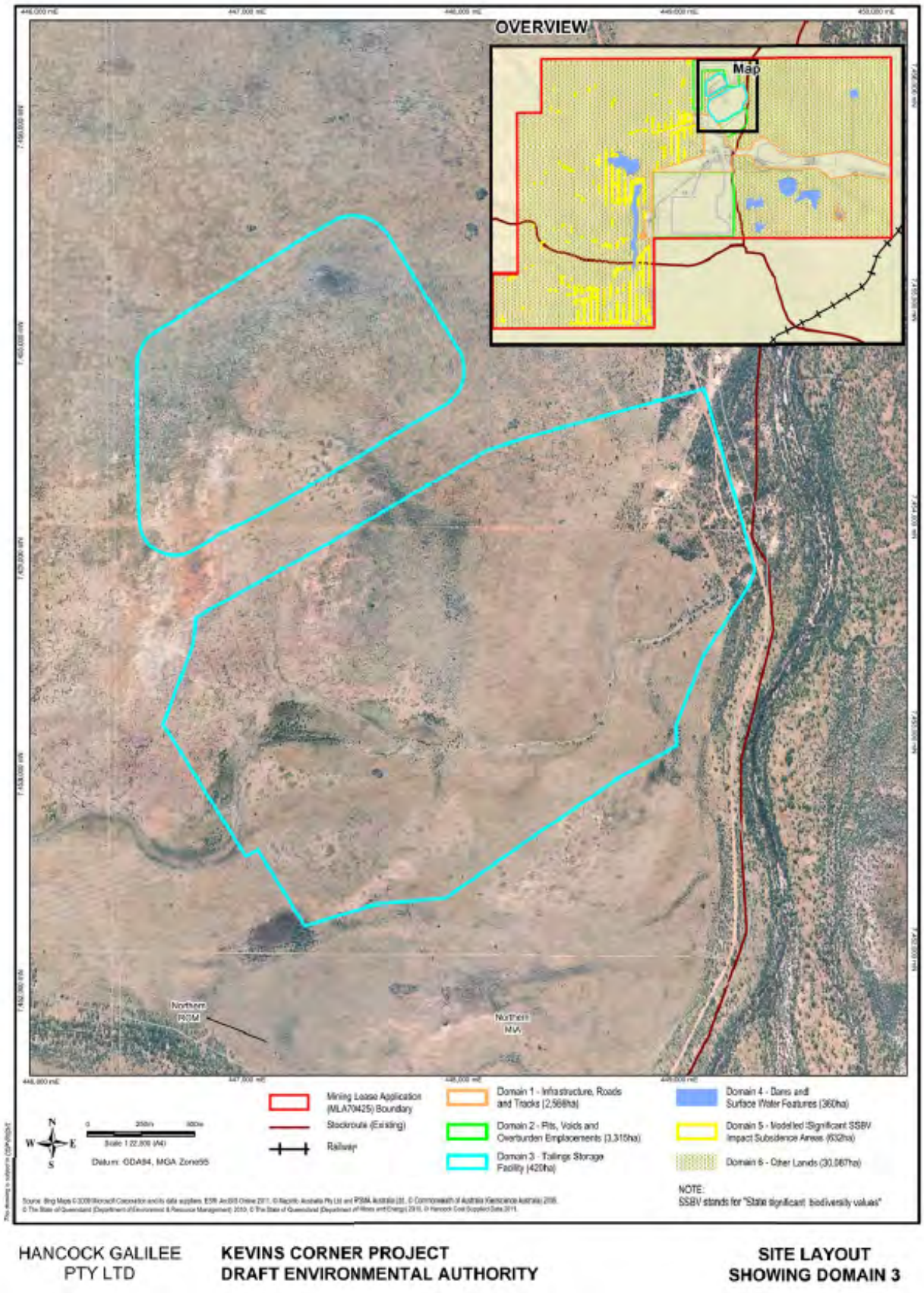
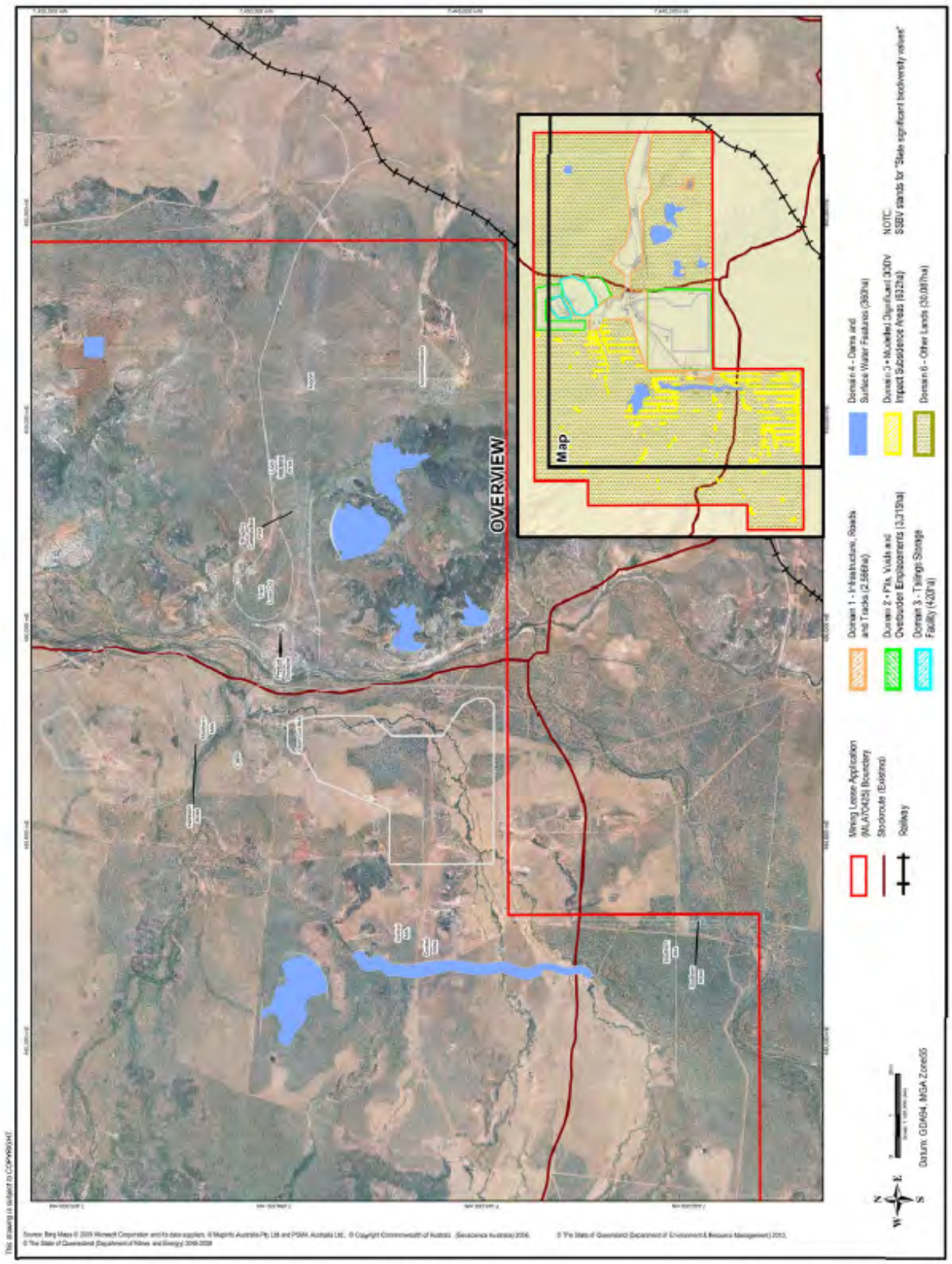


Figure 5: Site Layout showing Domain 4



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SITE LAYOUT
SHOWING DOMAIN 4

Figure 6: Site Layout showing Domain 5

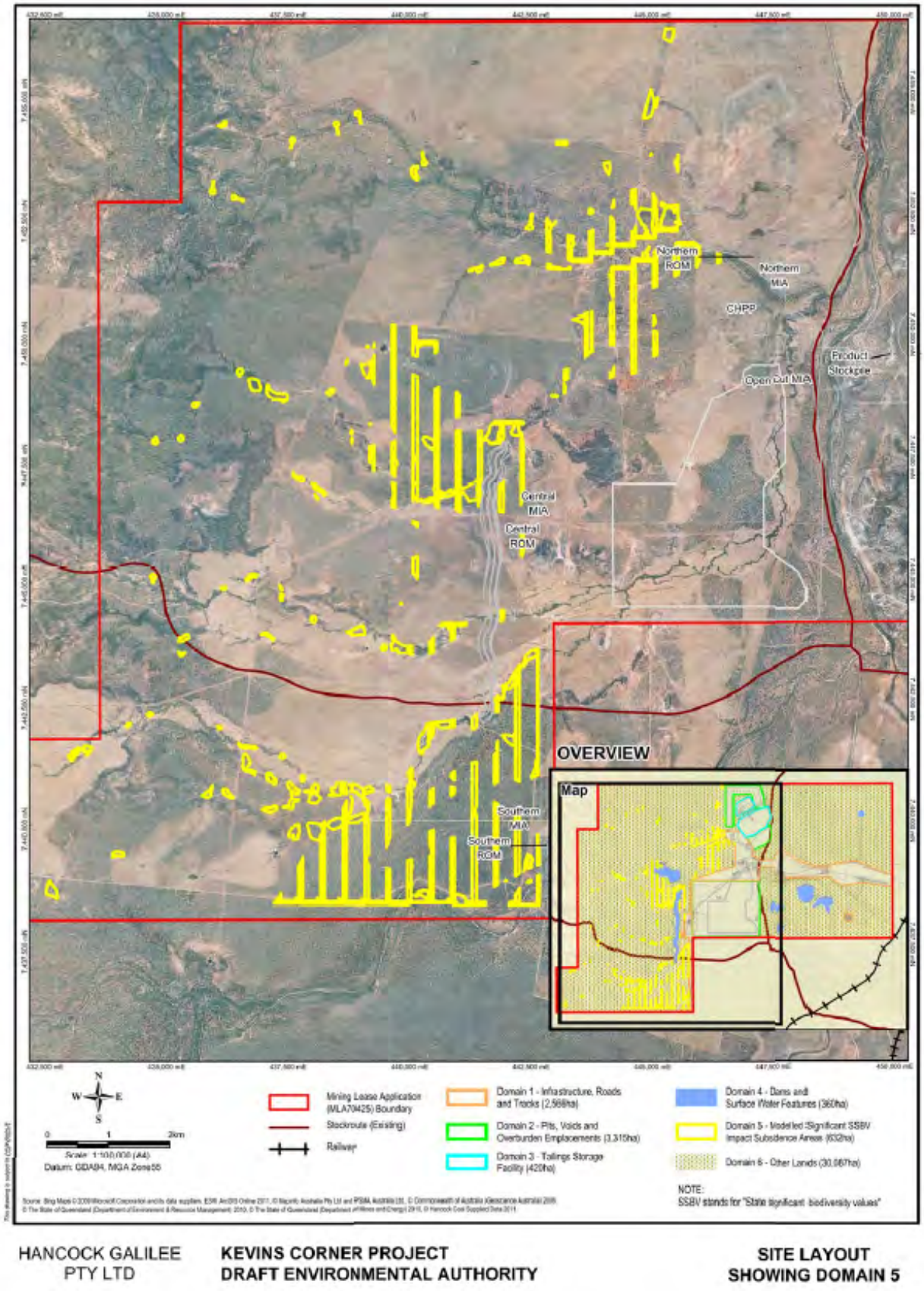
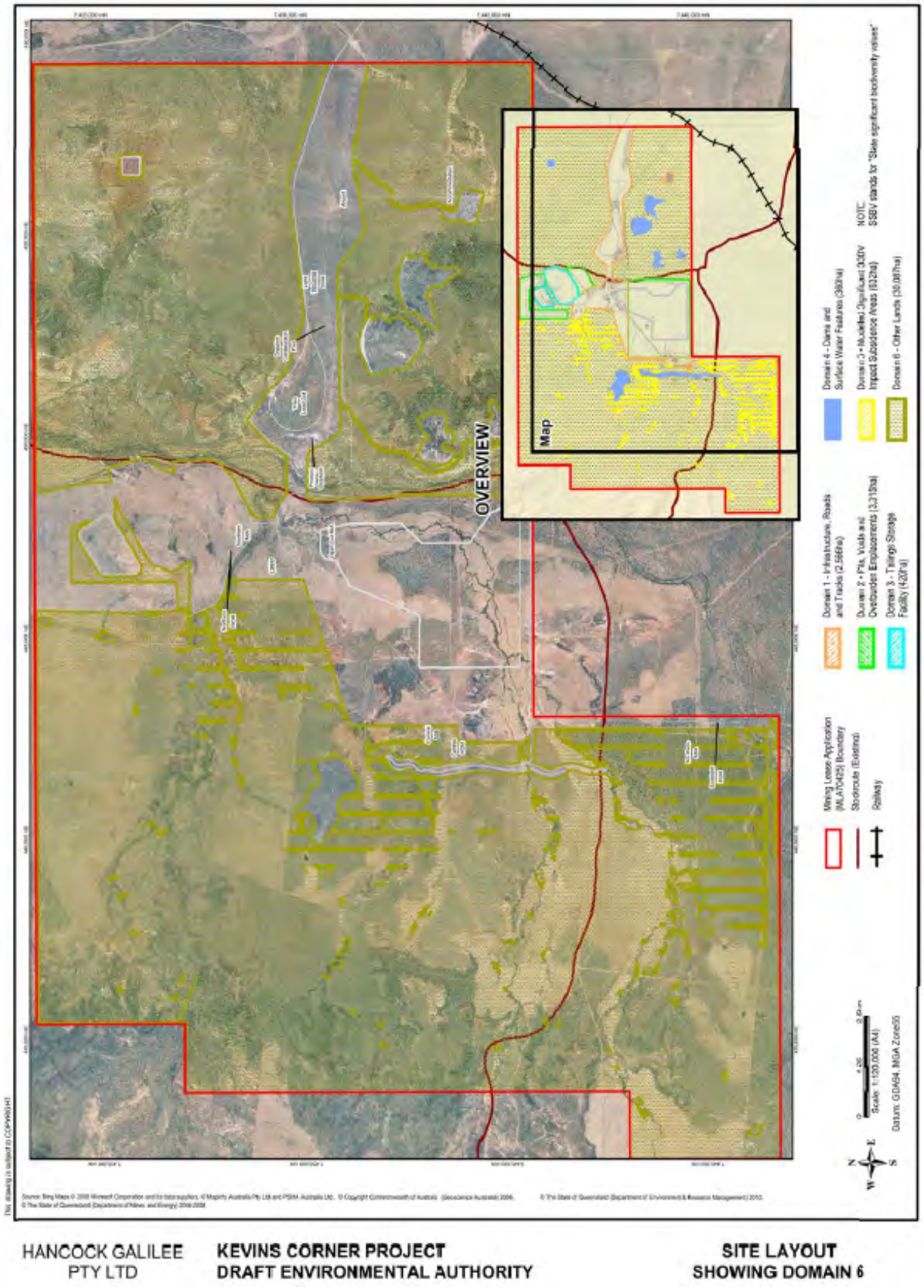


Figure 7: Site Layout showing Domain 6



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SITE LAYOUT
SHOWING DOMAIN 6

Figure 8: Mine Affected Water Release Points

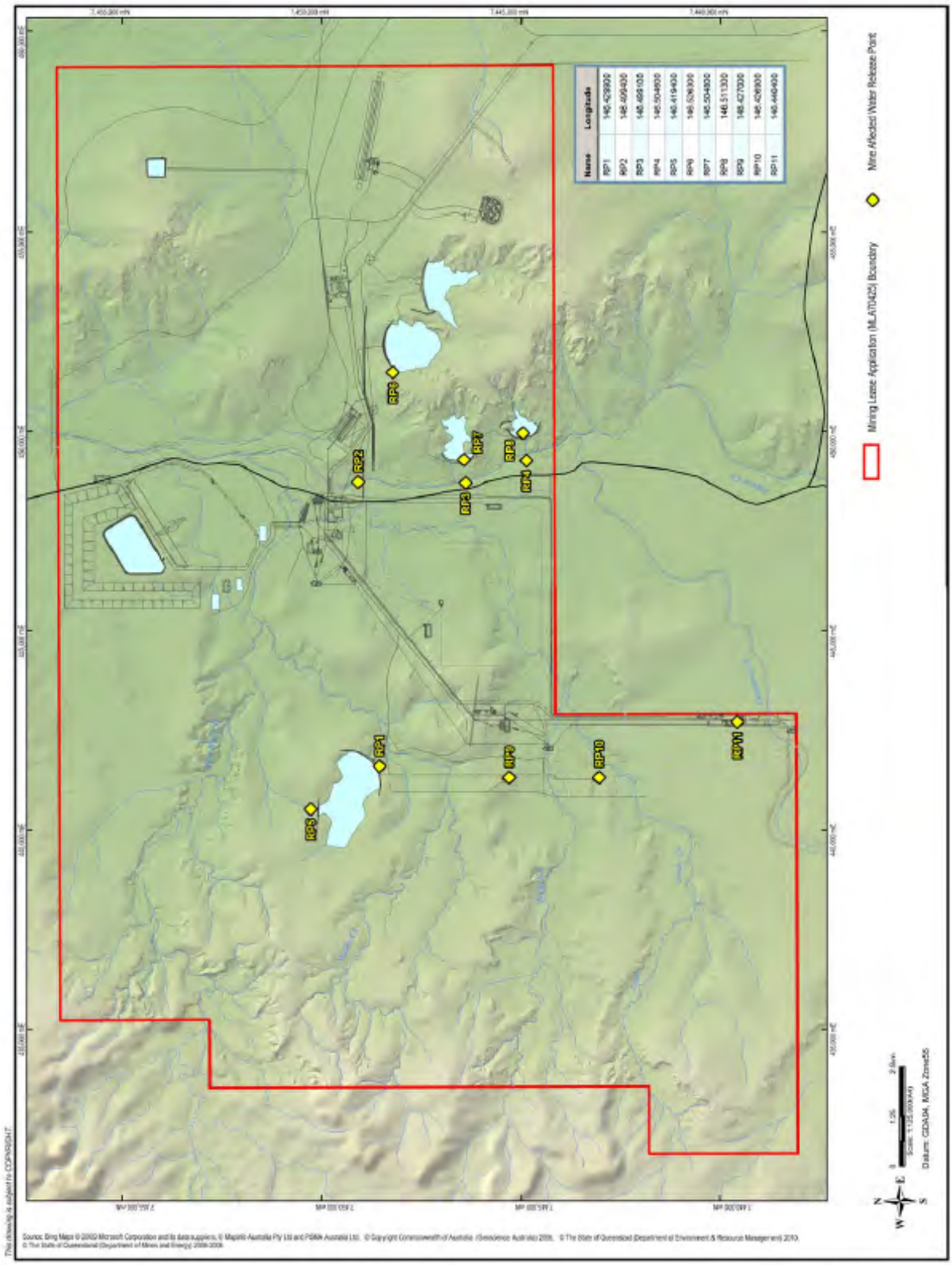
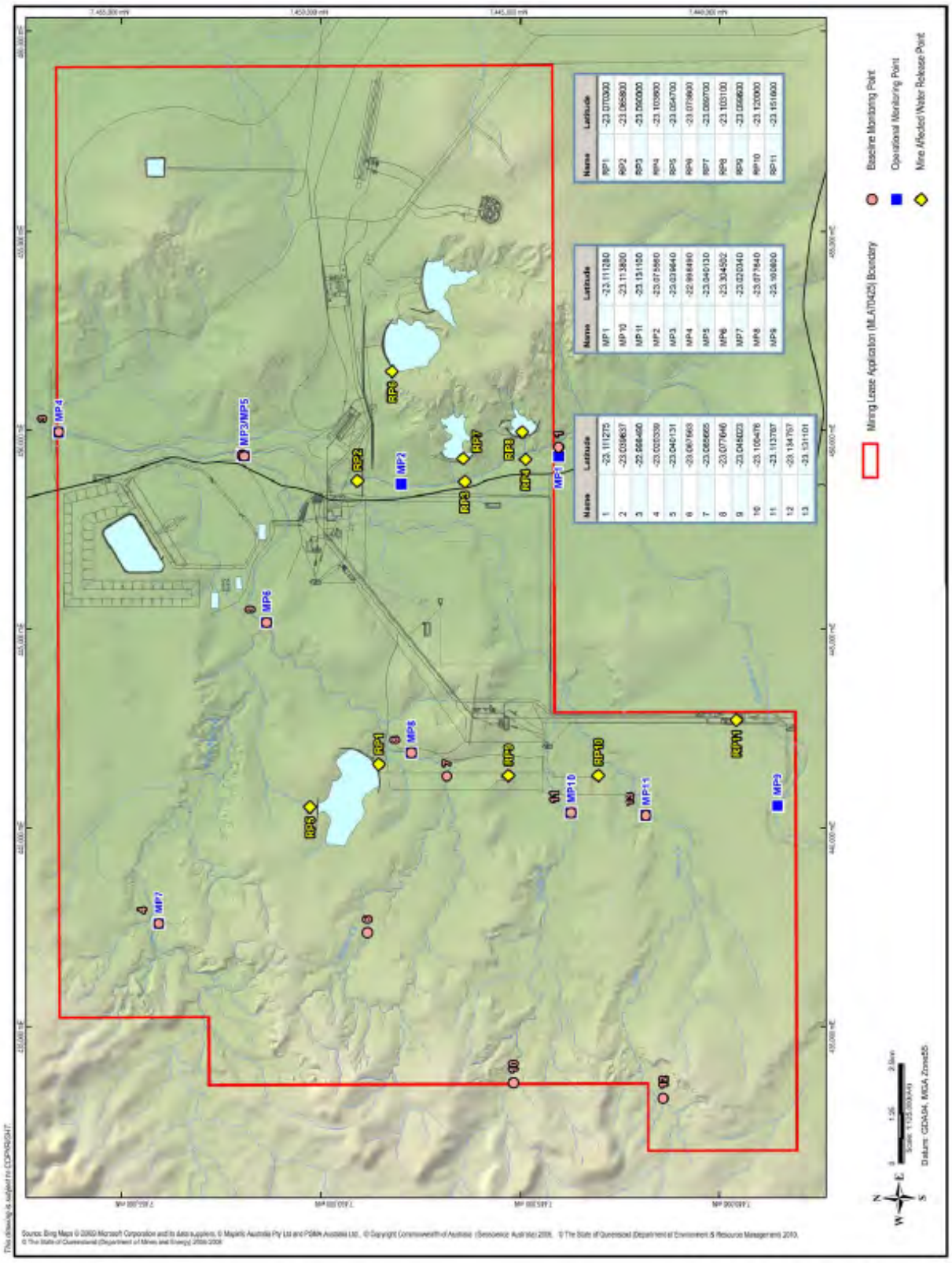


Figure 9: Receiving Water Upstream Background and Downstream Monitoring Locations



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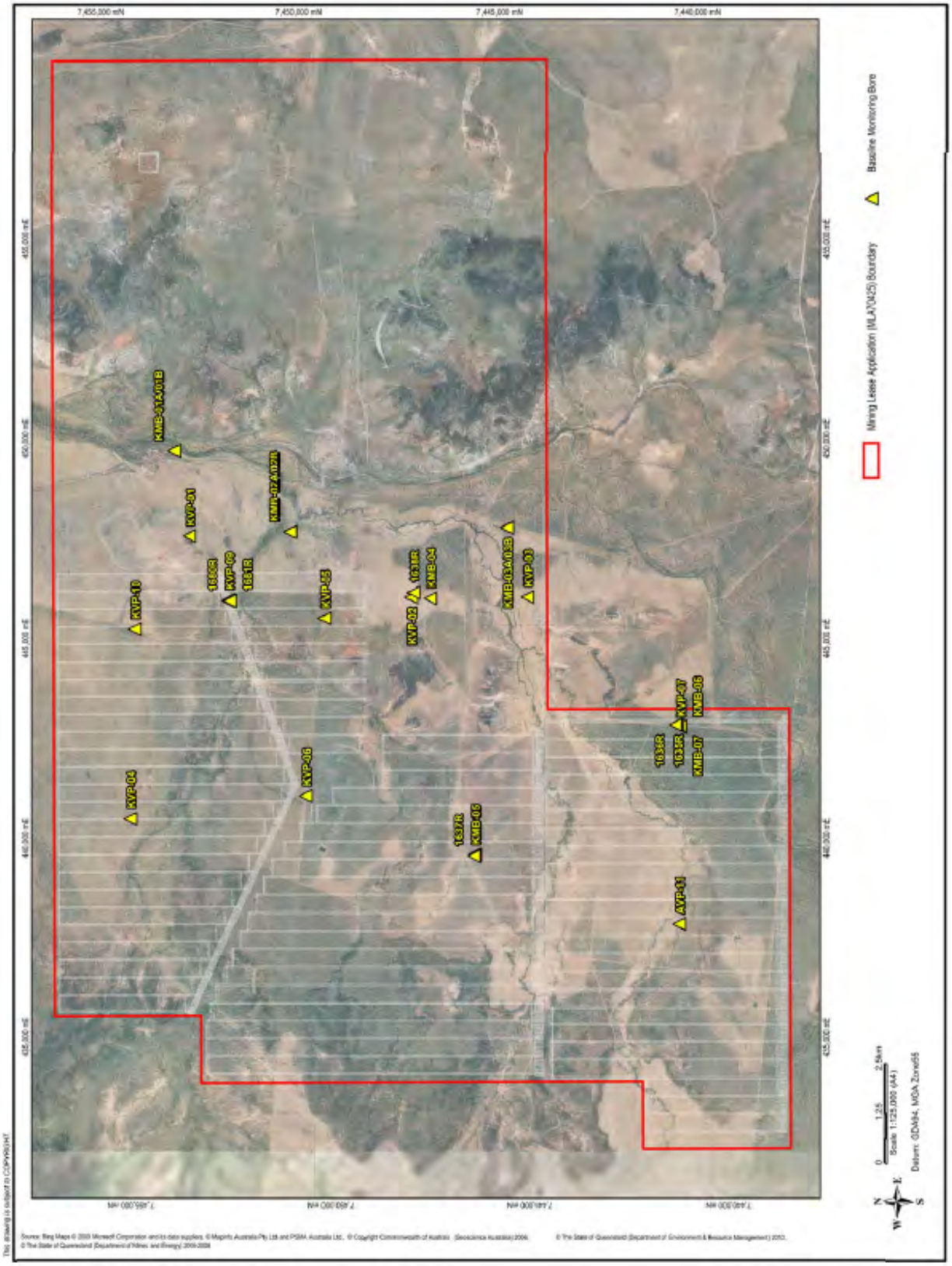
BASELINE AND OPERATIONAL SURFACE WATER QUALITY MONITORING POINTS

Figure 10: Groundwater Monitoring Locations



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GROUNDWATER MONITORING LOCATIONS

Schedule K – Definitions

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

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

"accepted engineering standards" in relation to dams, means those standards of design, construction, operation and maintenance that are broadly accepted within the profession of engineering as being good practice for the purpose and application being considered. In the case of dams, the most relevant documents would be publications of the Australian National Committee on Large Dams (ANCOLD), guidelines published by Queensland government departments, and relevant Australian and New Zealand Standards.

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

"administering authority" means the Department of Environment and Heritage Protection or its successor.

"AEP" means the Annual Exceedance Probability.

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

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

"annual exceedance probability" means the probability that at least one event in excess of a particular magnitude will occur in any given year.

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

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

"artesian bore" includes a shaft, well, gallery, spear or excavation, and any works constructed in connection with the shaft well, gallery, spear or excavation, that taps an aquifer and the water flows, or has flowed, naturally to the surface.

"assessed" or **"assessment"** by a suitably qualified and experienced person in relation to a hazard assessment of a dam, means that a statutory declaration has been made by that person and, when taken together with any attached or appended documents referenced in

that declaration, all of the following aspects are addressed and are sufficient to allow an independent audit at any time:

(a) exactly what has been assessed and the precise nature of that assessment;

(b) the relevant legislative, regulatory and technical criteria on which the assessment has been based;

(c) 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

(d) the reasoning on which the assessment has been based using the relevant data and facts, and the relevant criteria.

"associated works" in relation to a dam, means:

(a) operations of any kind and all things constructed, erected or installed for that dam; and

(b) any land used for those operations.

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

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

"beneficial use" in respect of dams means that the current or proposed owner of the land on which a dam stands, has found a use for that dam that is:

(a) of benefit to that owner in that it adds real value to their business or to the general community;

(b) in accordance with relevant provisions of the *Environmental Protection Act 1994*;

(c) sustainable by virtue of written undertakings given by that owner to maintain that dam; and

(d) the transfer and use have been approved or authorised under any relevant legislation.

"bioregion" has the meaning defined in the *Queensland Biodiversity Offset Policy*.

"biosolids" means the treated and stabilised solids from sewage.

"blasting" means the use of explosive materials to fracture:

(a) rock, coal and other minerals for later recovery; or

(b) structural components or other items to facilitate removal from a site or for reuse.

"brine" means saline water with a total dissolved solid concentration greater than 40,000 mg/L, generated through water treatment activities.

"brine dam" means a regulated dam that is designed to receive, contain or evaporate brine.

“broker agreement” has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

“bunded” means within bunding consistent with Australian Standard 1940.

“coal handling and processing plant waste” means coarse reject and tailings.

“certification” means assessment and approval must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required by the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams, 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”** have a corresponding meaning as “certification”.

“class 1 pest” has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

“class 2 pest” has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

“commencement of mining activities” means the commencement of activities permitted by the issue of a mining lease under the *Mineral Resources Act 1989* for the operational land not including early works.

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

“completion criteria” means the measures by which the actions implemented to rehabilitate the land are deemed to be complete. The completion criteria indicate the success of the rehabilitation outcome or remediation of areas which have been significantly been disturbed by the mining activities. Completion criteria may include information regarding:

(a) vegetation establishment, survival and succession;

(b) vegetation productivity, sustained growth and structure development;

(c) fauna colonisation and habitat development;

(d) ecosystem processes such as soil development and nutrient cycling, and the recolonisation of specific fauna groups such as collembola, mites and termites which are involved in these processes;

(e) microbiological studies including recolonisation by mycorrhizal fungi, microbial biomass and respiration;

(f) effects of various establishment treatments such as deep ripping, topsoil handling, seeding and fertiliser application on vegetation growth and development;

(g) resilience of vegetation to disease, insect attack, drought and fire; and

(h) vegetation water use and effects on ground water levels and catchment yields.

"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.

"contaminate" means to render impure by contact or mixture.

"contaminated" means the substance has come into contact with a contaminant.

"contaminant" A contaminant can be –

(a) a gas, liquid or solid; or

(b) an odour; or

(c) an organism (whether alive or dead), including a virus; or

(d) energy, including noise, heat, radioactivity and electromagnetic radiation; or

(e) a combination of contaminants.

"control measure" means any action or activity that can be used to prevent or eliminate a hazard or reduce it to an acceptable level.

"costeaning" means the digging of a trench or put across the seam or ore body for exposing, sampling and mapping of the ore body.

"cover material" means any soil or rock suitable as a germination medium or landform armouring.

"dam" means a land-based structure or a void that contains, diverts or controls flowable substances, and includes any substances that are thereby contained, diverted or controlled by that land-based structure or void and associated works. A dam does not mean a fabricated or manufactured tank or container, designed and constructed to an Australian Standard that deals with strength and structural integrity of that tank or container.

"dam crest volume" means the volume of material (liquids and/or solids) that could be within the walls of a dam at any time when the upper level of that material is at the crest level of that dam. That is, the instantaneous maximum volume within the walls, without regard to flows entering or leaving (eg via spillway).

"declared pest" has the meaning given to it under the *Land Protection (Pest and Stock Route Management) Act 2002*.

"deed of agreement" means a legal agreement between the holder of the environmental authority and the administering authority. The deed of agreement governs the obligations of the holder of the environmental authority in relation to the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011). For clarity, the term deed of agreement in this environmental authority includes any subsequent version or amendment of the signed deed of agreement.

"design plan" is the documentation required to describe the physical dimensions of the dam, the materials and standards to be used for construction of the dam, and the criteria to be used for operating the dam. The documents must include design and investigation reports, specifications and certifications, together with the planned decommissioning and rehabilitation works and outcomes. A design plan may include 'as constructed' drawings.

“design storage allowance” means an available volume, estimated in accordance with the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published b the Department of Environment and Heritage Protection (or its successor), that must be provided in a dam as at 1 November each year in order to prevent a discharge from that dam to an annual exceedance probability (AEP) specified in that manual.

“designer” for the purposes of a regulated dam, means the certifier of the design plan for the regulated dam.

“**direct offset”** has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

“domain” means land management units within a mine site, usually with similar geophysical characteristics.

“dwelling” means any of the following structures or vehicles that is principally used as a residence –

(a) a house, unit, motel, nursing homer or other building or part of a building; or

(b) a caravan, mobile home or other vehicle or structure on land; or

(c) a water craft in a marina.

“effluent” treated waste water discharged from sewage treatment plants.

“emergency action plan” means documentation forming part of the operational plan held by the holder or a nominated responsible officer, that identifies emergency conditions that sets out procedures and actions that will be followed and taken by the dam owner and operating personnel in the event of an emergency. The actions are to minimise the risk and consequences of failure and ensure timely warning to downstream communities and the implementation of protection measures. The plan must require dam owners to annually update contact details that are part of the plan, and to comprehensively review the plan at least every five years.

“end of pipe” means the location at which water is released to waters or land.

"environmental authority holder” means the holder of this environmental authority.

“factor of safety” means the ratio of resisting forces to driving forces. The resisting force is the friction developed in a material along a potential failure plane under given loading conditions. The driving force is primarily gravity but can also include vibration loading and unbalanced groundwater pressures.

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

“**financial surety”** has the meaning defined in the *Queensland Biodiversity Offset Policy*.

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

“flowable substance” means matter or a mixture of materials which can flow under any conditions potentially affecting that substance. Constituents of a flowable substance can

include water, other liquids fluids or solids, or a mixture that includes water and any other liquids fluids or solids either in solution or suspension.

“foreseeable future” is the period used for assessing the total probability of an event occurring. Permanent structures and ecological sustainability should be expected to still exist at the end of a 150 year foreseeable future with an acceptable probability of failure before that time.

“hazard” in relation to a dam as defined, means the potential for environmental harm resulting from the collapse or failure of the dam to perform its primary purpose of containing, diverting or controlling flowable substances.

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

“holder” means any person who is the holder of, or is acting under the environmental authority.

“hydraulic performance” means the capacity of a regulated dam to contain or safely pass flowable substances based on a probability (AEP) of performance failure specified for the relevant hazard category in the *Manual of Assessing Hazard Categories and Hydraulic Performance of Dams*.

“impacts to State significant biodiversity values” means those impacts and State Significant Biodiversity values stated in the Site Based Offsets Plan.

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

“LA 10, adj, 15 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 10% of any 15-minute measurement period, using Fast response.

“LA 1, adj, 15 mins” means the A-weighted sound pressure level, (adjusted for tonal character and impulsiveness of the sound) exceeded for 1% of any 15-minute measurement period, using Fast response

“lake” includes –

(a) lagoon, swamp or other natural collection of water, whether permanent or intermittent; and

(b) the bed and banks and any other element confining or containing the water.

“land” in Schedule F: Land of this document means land excluding waters and the atmosphere.

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

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

“land use” term to describe the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

“landfill” means land used as a waste disposal site for lawfully putting solid waste on the land.

“leaf litter” means the uppermost layer of organic material in a soil, consisting of freshly fallen or slightly decomposed organic materials such as leaves, twigs and sticks, which have accumulated on the ground surface.

“legally secured” has the meaning defined in the October 2011 version of the *Queensland Biodiversity Offset Policy*.

“levee” means an embankment that only provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

“low hazard dam” means any dam that is not a high or significant hazard category as assessed using the Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.

“lower explosive limit” means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at $25^{O}C$ and atmospheric pressure.

“mandatory reporting level” means a warning and reporting level determined in accordance with the criteria in the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the administering authority.

“mg/L” means milligrams per litre.

“Mining activities” are defined as “prospecting, exploring or mining, processing minerals, a directly associated activity that may cause environmental harm, rehabilitating or remediating environmental harm, and action to prevent environmental harm because these activities, where the activity is authorised under the Mineral Resource Act 1989 to occur on land to which a mining tenement relates” (as defined in the Environmental Protection Act 1994).

A **“Mining project”** is defined as “all mining activities carried out, or proposed to be carried out, under 1 or more mining tenements, in any combination, as a single integrated operation” (as defined in the Environmental Protection Act 1994).

“mineral” means a substance which normally occurs naturally as part of the earth’s crust or is dissolved or suspended in water within or upon the earth’s crust and includes a substance which may be extracted from such a substance, and includes—

(a) clay if mined for use for its ceramic properties, kaolin and bentonite;

(b) foundry sand;

(c) hydrocarbons and other substances or matter occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connection with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil therefrom;

(d) limestone if mined for use for its chemical properties;

(e) marble;

(f) mineral oil or gas extracted or produced from shale or coal by in situ processes;

(g) peat;

(h) salt including brine;

(i) shale from which mineral oil may be extracted or produced;

(j) silica, including silica sand, if mined for use for its chemical properties;

(k) rock mined in block or slab form for building or monumental purposes;

But does not include—

(a) living matter;

(b) petroleum within the meaning of the *Petroleum Act 1923*;

(c) soil, sand, gravel or rock (other than rock mined in block or slab form for building or monumental purposes) to be used or to be supplied for use as such, whether intact or in broken form;

(d) water.

"mine affected water" means the following types of water:

(a) pit water, tailings dam water, processing plant water;

(b) water contaminated by a mining activity which would have been an environmentally relevant activity under Schedule 2 of the *Environmental Protection Regulation 2008* if it had not formed part of the mining activity other than effluent or brine;

(c) rainfall runoff which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated, excluding rainfall runoff discharging through release points associated with erosion and sediment control structures that have been installed in accordance with the standards and requirements of an Erosion and Sediment Control Plan to manage runoff containing sediment only, provided that this water has not been mixed with pit water, tailings dam water, processing plant water or workshop water;

(d) groundwater which has been in contact with any areas disturbed by mining activities which have not yet been rehabilitated;

(e) groundwater from the mine's dewatering activities;

(f) a mix of mine affected water (under any of paragraphs (a)-(e)) and other water.

"mining waste" means waste rock, spoil, overburden, tailings and course reject material.

“modification” or **“modifying”** see construction.

“MRL” means Mandatory Reporting Level.

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

“nature” includes:

ecosystems and their constituent parts; and

all natural and physical resources; and

natural dynamic processes.

“non-artesian exploration drill hole” means an exploration drill hole that does not intersect aquifers of an artesian basin.

“noxious” means harmful or injurious to health or physical well being.

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

“operational land” means the land associated with the project for which this environmental authority has been issued.

“operational plan” for a dam means a document that amongst other things sets out procedures and criteria to be used for operating a dam during a particular time period. The operational plan as defined herein may form part of a plan of operations or plan otherwise required in legislation.

“offset” means either a:

- direct land based offsets:
  - values to be offset using a direct land based offset;
  - an assessment of the offset area to demonstrate how it meets the requirements of the Biodiversity Offset Policy;
  - an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology.;
  - legally binding mechanism; and
  - offset area management plan.
- offset transfer:
  - values to be offset using an offset transfer
  - evidence that State significant biodiversity values to be impacted can be offset within the landscape;
  - an assessment of ecological equivalence carried out in accordance with the Ecological Equivalence Methodology;
  - Brokers Agreement or applicant letter; and
  - Identification of financial surety amount and calculation method
- offset payment:

- the values to which the proposed offset payment relates; and
- offset payment amount and calculation method.

developed in accordance with the *Queensland Biodiversity Offsets Policy* dated [Version 1 dated 3 October 2011].

"offset payment" has the meaning given to it in the Queensland Biodiversity Offset Policy.

"offset transfer" has the meaning given to it in the *Queensland Biodiversity Offset Policy*.

"palletised" means stored on a movable platform on which batteries are placed for storage or transportation.

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

"PMF" means probable maximum flood.

"probable maximum flood" means the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area.

"protected area" means:

(a) a protected area under the *Nature Conservation Act 1992*; or

(b) a marine park under the *Marine Parks Act 1992*; or

(c) a World Heritage Area.

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

"public utility works" means:

(a) the replacement, modification or relocation of public utilities required as a consequence of the project; and

(b) the construction of new utility infrastructure required for the project.

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

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

"reference site" means an unmined feature against which a mined and rehabilitated feature may be compared. A reference site may reflect the original location or adjacent area of a disturbed area, where representative control plots are established, as nominated by the environmental authority holder. Reference sites must be:

- areas of similar chemical and physical characteristics to the proposed rehabilitated areas;
- established in typical areas of each pre-mining regional ecosystem (vegetation community);
- not impacted by the mining activity;

- acceptable to the administering authority prior to use;
- in a similar ecological setting;
- utilised in a similar capacity as the proposed post mine land use; and
- under a similar fire regime as the proposed rehabilitated areas.

Rehabilitation must be compared with those reference sites that most typically reflect the pre-mining regional ecosystem that the environmental authority holder is seeking to redevelop in the rehabilitation.

“recycled water” means appropriately treated effluent and urban stormwater suitable for further use.

“regulated dam” means any dam in the significant or high hazard category as assessed using the *Manual for Assessing Hazard Categories and Hydraulic Performance of Dams* published by the administering authority.

“regulated structure” means either a regulated dam or levee.

“rehabilitation” means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with the completion criteria set out in this environmental authority and, where relevant, includes remediation of contaminated land.

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

“residual void” means an open pit resulting from the removal of ore and/or waste rock which will remain following the cessation of all mining activities and completion of rehabilitation processes.

“saline drainage” means the movement of waters, contaminated with salt(s), as a result of the mining activity.

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

“sensitive place” means:

- a 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;
- a protected area; or
- a public park or gardens; or
- 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

except where located on the mining lease subject to this authority.

“sewage” means the used water of person’s to be treated at a sewage treatment plant.

“spillway” means a weir, channel, conduit, tunnel, gate or other structure designed to permit discharges form the dam, normally under flood conditions or in anticipation of flood conditions.

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

“stock” has the meaning given to it under the *Stock Act 1915*.

“storm water” means all surface water runoff from rainfall.

“State Significant Biodiversity Values” means the values identified in Appendix A State Significant Biodiversity Values of the Queensland Biodiversity Offset Policy (Version 1 dated 3 October 2011).

“subartesian bore” includes a shaft, well, gallery, spear or excavation (excluding the mining pits), and any works constructed in connection with the shaft, well, gallery, spear or excavation, that taps an aquifer and the water does not flow and never has flowed naturally to the surface.

“subartesian water” means water that occurs naturally in, or is introduced artificially into, an aquifer, which I tapped by a bore, would not flow naturally to the surface.

“suitably qualified and experienced person” in relation to regulated structures means a person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Engineers Act 2002*, and has demonstrated competency and relevant experience:

- for regulated dams, and RPEQ who is a civil engineer with the required qualifications in dam safety and dam design;
- for regulated levees, an RPEQ who is a civil engineer with the required qualifications in the design of flood protection embankments.

NOTE: It is permissible that a suitably qualified and experienced person obtain subsidiary certification from an RPEQ who has demonstrated competence and relevant experience in either geomechanics, hydraulic design or engineering hydrology.

“system design plan” means a plan that manages and integrated containment system that shares the required DSA volume across the integrated containment system.

“void” means any constructed, open excavation in the ground.

“water” means –

(a) water in waters or spring;

(b) underground water;

(c) overland flow water; or

(d) water that has been collected in a dam.

“water bore” means an artesian bore or a subartesian bore.

“water monitoring bore” means a water bore used for monitoring impacts on underground water caused by the mining activities.

“water quality” means the chemical, physical and biological condition of water.

“water year” means the 12 month period from 1 July to 30 June.

“watercourse” has the same meaning given in the *Water Act 2000*.

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

“wet season” means the time of year, covering one or more months, when most of the average annual rainfall in a region occurs. For the purposes of DSA determination this time of year is deemed to extend from 1 November in one year to 31 May in the following year inclusive.

“µg/L” means micrograms per litre

“µs.cm-1“ means microsiemens per centimetre

Attachment A – Rehabilitation Requirements

Table A1: Rehabilitation Completion Criteria

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Domain 1 Infrastructure	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated.
				Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with *the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012)* or latest edition.
				Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with *the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government. February 2012)* or latest edition.
			All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the *Water Act 2000*. Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012) or latest edition.
		Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by an appropriately qualified person, in the Rehabilitation Report that site slopes are now safe and will remain so.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4: Landform Design Criteria.
		Site is safe for humans and animals now and in the foreseeable future.	Appropriate decommissioning of infrastructure.	Certification by an appropriately qualified person in the site Rehabilitation Report that the infrastructure has been decommissioned and rehabilitated.Buildings, water storage(s), roads (except those used by the public), and other infrastructure have been removed unless stakeholders have entered into formal written agreements for their retention. Areas are readily accessible and conducive to safe cattle management activities.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
				Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by an suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Hazardous materials adequately managed.	Exposure to and availability of heavy metals and other toxic materials.	Certification by an suitably qualified and experienced person, that the Rehabilitation Report includes predictions about future changes and that specified cover thickness is in place..
				Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
		Removal of potential sources of contamination.	Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Stable landform	Landform design achieves appropriate erosion rates.	Slope angle and length.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A4 Landform Design Criteria.
			Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited at the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation type and density are of species suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meet the goals set it the site Rehabilitation Management Plan.
				Vegetation types and densities are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m^2 in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the *Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the *ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).*
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
		Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site , as identified in Table A5 – Reference Sites are present.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5 – Reference sites..
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5 – Reference Sites..

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas).	Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person in the site Rehabilitation Report that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
Domain 2 Pits, Voids and Overburden Emplacements	Long term safety	Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by an suitably qualified person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected generally in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A2 Void Design Criteria and A4 – Landform Design Criteria.
			Exposure to and availability of heavy metals and other toxic	Certification by a suitably qualified person, in Rehabilitation Report that specified cover thickness is in place and predictions about future changes.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			materials.	Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
			Stream bank erosion.	Evidence in the Rehabilitation Report that all creek diversions are stable at closure and are likely to remain that way into the foreseeable future.
		Site is safe for humans and animals now and in the foreseeable future.	Safety assessment of landform stability (geotechnical studies).	The void is certified by a suitably qualified and experienced person as being decommissioned appropriately.
				Geotechnical stability of the highwall, low wall and end walls has been achieved and geotechnical investigations demonstrating this have been undertaken and reported.
				Highwall faces exhibit long-term geotechnical stability and a geotechnical report has been completed.
				Ramp walls not backfilled exhibit long-term geotechnical stability and a geotechnical report has been completed.
			Adequacy and predicted long-term performance of safety barriers.	Evidence in the Rehabilitation Report that an adequate Safety Plan has been implemented.
			Installation of safety barriers and human/wildlife exclusion fencing of final void.	Fencing or other suitable barrier installed around the perimeter of the final void to restrict access, if required following safety assessment.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
				Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
			Voids protected from flooding.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Diversion design and maintenance.	The administering authority of the Water Licence under the *Water Act 2000* has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the *Water Act 2000* that the Water Licence is no longer required.
		Acid mine drainage will not cause serious environmental harm.	Technical design of coarse reject cells.	Certification by a suitably qualified and experienced person in the Rehabilitation Report that the coarse reject placement was in accordance with the Mine Waste Management Plan.
			Pit water quality.	Certification by an appropriately qualified person in the Rehabilitation Report that the water quality within the open cut voids is in compliance with the EA.
	Stable landform	Very low probability of slope slippage or failure with serious environmental consequences	Past record of slope failure.	Evidence in the Rehabilitation Report that the slope failure has been rectified and appropriate control measures are in place to prevent recurrence.
		Landform design achieves appropriate erosion rates	Slope angle and length.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A5: Landform Design Criteria.
			Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
		Vegetation cover to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meet the goals set it the site Rehabilitation Management Plan. Priority will be given to native species.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m^2 in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the *Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the *ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).*
		Very low probability of rock falls with serious environmental consequences.	Geotechnical studies	Evidence in the Rehabilitation Report that appropriate risk assessment has been undertaken and control measures put in place
			Past record of rock falls.	Evidence in the Rehabilitation Report that appropriate control measures are in place to prevent recurrence.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Media characterisation studies.	Certification by an appropriately qualified person that planting media characteristics do not pose significant constraints to plant growth following amelioration.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan (to be prepared following the completion of vegetation trials on highly modified environments) occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural Cattle Grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
Domain 3 Tailings Storage	Long term safety	Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
Facility				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4 Landform Design Criteria.
			Exposure to and availability of heavy metals and other toxic materials.	Certification by an appropriately qualified person, in Rehabilitation Report that specified cover thickness is in place and predictions about future changes.
				Evidence in Rehabilitation Report that dust monitoring results at nuisance sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
			Appropriate decommissioning of regulated structures and other dams.	The Tailings Storage Facility is certified by a suitably qualified and experienced person.
			Safety assessment of landform stability.	Certification in the Rehabilitation Report that site slopes are now safe and are likely to remain that way into the foreseeable future.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
				Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Diversion design and maintenance.	The administering authority of the Water Licence under the *Water Act 2000* has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the *Water Act 2000* that the Water Licence is no longer required.
		Acid mine drainage will not cause serious environmental harm.	Technical design of Tailings Storage Facility.	Certification by a suitably qualified and experienced person in the Rehabilitation Report that the Tailings placement was in accordance with the Mine Waste Management Plan.
				Certification by an appropriately qualified person in the Rehabilitation Report that the surface and groundwater quality is in accordance with the EA.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Hazardous materials adequately managed.	Exposure to and availability of heavy metals and other toxic materials.	Evidence that monitoring surface water quality for 5 years post closure has complied with specified guideline values.
				Leaching tests of selected exposed mine waste material meet specified guideline values.
	Stable landform	Landform design achieves appropriate erosion rates.	Slope angle and length.	Evidence in the Rehabilitation Report that the rehabilitated slopes have been designed to the specifications outlined in Table A4 Landform Design Criteria.
			Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the visual erosion meet the goals set in the site Rehabilitation Management Plan.
				Vegetation types and densities are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m^2 in area or >10m in length down slope.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report of how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. Diversions and drainage lines to be designed and constructed in accordance with the *Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the *ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).*
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
			Media characterisation studies.	Certification by an appropriately qualified person that planting media characteristics do not pose significant constraints to plant growth following amelioration.
		Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.
		Self-sustaining natural vegetation or	Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		habitat.	Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
Domain 4 Dams and Surface Water Features	Long term safety	Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4 Landform Design Criteria.
			Exposure to and availability of heavy metals and other toxic materials.	Certification by a suitably qualified person, in Rehabilitation Report that includes predictions about future changes and that specified cover thickness is in place .
				Evidence in Rehabilitation Report that dust monitoring results at sensitive receptors have complied, with limits.
			Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
				Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by an suitably ly qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
			Voids protected from flooding.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.
		Diversion design and maintenance.	The administering authority of the Water Licence under the *Water Act 2000* has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the *Water Act 2000* that the Water Licence is no longer required.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Site is safe for humans and animals now and in the foreseeable future.	Appropriate decommissioning of regulated structures and other dams.	Certification by a suitably qualified and experienced person, in the site Rehabilitation Report that the all regulated structures (dams and levees) have been decommissioned and rehabilitated.
	Stable landform	Landform design achieves appropriate erosion rates.	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited at the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
			Dimensions and frequency of occurrence of erosion rills and gullies.	Evidence that dimensions and frequency of occurrence of erosion rills and gullies are no greater than that in the corresponding reference sites.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and density are suited to the spoil composition, slope, aspect, climate and other factors, and that the visual erosion meet the goals set it the site Rehabilitation Management Plan.
				Vegetation types and density are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m^2 in area or >10m in length down slope.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the *Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
		Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas).	Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
		Establish self-sustaining natural vegetation or habitat (natural system on highly modified environments).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified in the Landscape Planting Plan occur on site.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is equivalent to the density specified in the Landscape Planting Plan.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure exist in accordance with those specified in the Landscape Planting Plan.
			Vegetation trials.	Certification by an appropriately qualified person that vegetation trials have identified groundcover, shrub and canopy species which will survive and are likely to reproduce on the relevant media.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
Domain 5 Modelled Significant SSBV Impact Subsidence Areas	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated.
				Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012)* or latest edition.
				Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government. February 2012)* or latest edition.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the *Water Act 2000*. Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012)* or latest edition.
		Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies)	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected generally in accordance with relevant guidelines and Australian Standards.
				Landform design meets the design requirements of Table A4 Landform Design Criteria.
			Stream bank erosion.	Evidence in the Rehabilitation Report that all creek diversions are stable at closure and are likely to remain that way into the foreseeable future.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			surface water systems.	Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
			Voids protected from flooding.	Certification by a suitably qualified and experienced person in the site Rehabilitation Report that the final voids have an adequate protection system to prevent inundation from a 1:1000 AEP event.
		Diversion design and maintenance.	The administering authority of the Water Licence under the *Water Act 2000* has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the *Water Act 2000* that the Water Licence is no longer required.
		Hazardous materials adequately managed.	Exposure to and availability of heavy metals and other toxic materials.	Certification by a suitably qualified person, in Rehabilitation Report that includes predictions about future changes and that specified cover thickness is in place
				Evidence in Rehabilitation Report that dust monitoring results at sensitive receptors have complied, with limits.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Removal of potential sources of contamination.	Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
	Stable landform	Landform design achieves appropriate erosion rates.	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation species type and densities are suited to the spoil composition, slope, aspect, climate and other factors, and that the soill erosion meets the goals set it the site Rehabilitation Management Plan.
				Vegetation types and density are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20 m^2 in area or >10 m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report of how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: *Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the ACARP report *Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).*

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Surface water drainage.	Stable drainage works.	Certification by a suitably qualified and experienced person that local drainage works (e.g. small diversion bunds, engineered rock chute structures, etc) have been properly designed and constructed.
		No significant changes to hydrological conditions.	Ponding.	Evidence in the Rehabilitation Report that no ponding occurs and that excavation of pillar zones from creek channels to facilitate natural drainage of ponded areas has been undertaken.
			Cracking.	Evidence in the Rehabilitation Report that no subsidence cracks greater than 25 mm occur (that are attributable to subsidence) and that ripping and seeding of all subsidence cracks greater than this threshold have been undertaken.
		Stable geomorphic system.	Geomorphic environment survey.	A geomorphic environment survey report (at the end of the mine life) stating that a stable geomorphic system is able to continue to evolve into the future.
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths present prior to disturbance.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
		Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site are present, as identified in Table A5– Reference Sites.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5– Reference Sites..
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5– Reference Sites.
		Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas).	Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Weed hygiene procedures.	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural Cattle Grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.
Domain 6 Other Lands	Long term safety	Rehabilitation or conversion of exploration drill holes and groundwater monitoring bores.	All non-artesian exploration drill holes undertaken on the Mining Lease (MLA 70425) have been rehabilitated or converted to water bores.	Certification by an appropriately qualified person that all non-artesian exploration drill holes not converted to either a water bore or a groundwater monitoring bore have been rehabilitated.
				Certification by an appropriately qualified person, that all sub-artesian aquifers have been isolated where non-artesian exploration drill holes have intersected more than one sub-artesian water bearing strata, in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012)* or latest edition.
				Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to a water bore have been converted in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government. February 2012)* or latest edition.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All monitoring bores undertaken on the Mining Lease (MLA 70425) have been rehabilitated.	Certification by an appropriately qualified person that all non-artesian exploration drill holes converted to water bores are compliant with the requirements of the *Water Act 2000*. Certification by an appropriately qualified person that all monitoring bores have been rehabilitated in accordance with the *'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, February 2012)* or latest edition.
		Structurally safe with no hazardous materials.	Safety assessment of landform stability (geotechnical studies).	Certification by a suitably qualified and experienced person, in the Rehabilitation Report that site slopes are now safe and will remain so.
				Risks assessment has been completed and risk mitigation measures have been implemented. Where risk mitigation measures include bunds, safety fences and warning signs, these have been erected in accordance with relevant guidelines and Australian Standards.
	Non-polluting	Mine affected water contained on site.	Downstream surface water quality.	Certification by an appropriately qualified person that surface water quality at monitoring locations is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Groundwater quality.	Certification by an appropriately qualified person that groundwater monitoring indicates that the groundwater quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
			Final landform water storages are contained on site, with no overflows into external surface water systems.	Certification by an appropriately qualified person that surface water monitoring indicates that surface water quality is not negatively impacted compared to the baseline monitoring results by the rehabilitated landform.
				Receiving waters affected by surface water runoff have contaminant limits in accordance with the EA.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			All permanent diversion channels will meet approved design criteria.	Certification by a suitably qualified and experienced person that the permanent diversion channels have been constructed and are operating in accordance with approved design criteria.
			All permanent regulated structures will meet approved design criteria.	The regulated structures are certified by a suitably qualified and experienced person.
			All non-permanent regulated structures decommissioned appropriately.	Regulated structures are decommissioned in accordance with the administering authority requirements.
		Removal of potential pollution sources.	Results of site contaminated land investigation report.	Evidence in Rehabilitation Report that measures required in site contaminated land investigation report have been implemented.
		Diversion design and maintenance.	The administering authority of the Water Licence under the *Water Act 2000* has determined that the Water Licence is no longer required.	Confirmation in writing from the administering authority of the Water Licence under the *Water Act 2000* that the Water Licence is no longer required.
	Stable landform	Landform design achieves appropriate erosion rates.	Engineered structures to control water flow.	Evidence in the Rehabilitation Report that required contour banks, channel linings, surface armour, engineered drop structures, etc. are in place and functioning.
			Rates of soil loss.	Certification by a suitably qualified person that all land disturbed by the mining activities does not exhibit any signs of continued erosion greater than that exhibited in the reference site. The applicable reference site must have the same chemical and physical characteristics including slope, slope length and fire regime as that of the rehabilitated landform.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Vegetation cover for self-sustaining community and to minimise erosion.	Vegetation type and density.	Evidence that the vegetation type and density are of species suited to the spoil composition, slope, aspect, climate and other factors, and that the soil erosion meets the goals set it the site Rehabilitation Management Plan.
				Vegetation types and density are comparable with the relevant reference site.
			Foliage cover.	Minimum of 70% groundcover is present (or 50% if rocks, logs or other features of cover are present). No bare surfaces >20m^2 in area or >10m in length down slope.
		The diversions and run off drainage lines mirror natural stream functions.	Design and stability of drainage diversions.	Documentation in the Rehabilitation Report how drainage diversions have changed over the course of the Project and that they are stable at closure and are likely to remain that way into the foreseeable future. To be designed and constructed in accordance with the *Queensland Government Natural Resources and Mines, Central West Water Management and Use Regional Guideline: Watercourse Diversions-Central Queensland Mining Industry, (2008)* and the ACARP report Maintenance of Geomorphic Processes in Bowen Basin River diversions (Project number C8030-C9068).
	Sustainable land use	Soil properties support the desired land use.	Chemical properties (e.g. pH, salinity, nutrient content, sodium content) of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the topsoil chemical properties do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <0.6 dS/m. Soil pH is between 5.5 and 8.5. Soil Exchange Sodium Percentage (ESP) is <15%. Adequate macro and micro-nutrients are present.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
				Certification in the Rehabilitation Report that the subsoil chemical properties to a depth of 1m do not limit the suitability of the land for the intended land use and are consistent with the following: Soil salinity content is <1.5 dS/m. Soil pH is between 5.5 and 9.0. Soil Exchange Sodium Percentage (ESP) is <30%.
			Physical properties of topsoil and subsoil to support the proposed vegetation and land use.	Certification in the Rehabilitation Report that the soil physical properties (e.g. rockiness, depth of soil (including topsoil), wetness, plant available water capacity (PAWC), surface condition) are such that conditions are adequate for plant growth. Suitability for beef cattle grazing land use in accordance with Department of Minerals and Energy (DME) 1995. *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining*.
			Top soil thickness.	Evidence in the Rehabilitation Report that topsoil has been respread according to the depths required in the Topsoil Management Plan.
			Soil site characteristics.	Certification in the Rehabilitation Report that the soil site characteristics have acceptable levels of surface roughness, infiltration capacity, aggregate stability and surface condition.
		Establish self-sustaining natural vegetation or habitat (remnant vegetation areas).	Presence of key plant species.	Certification by an appropriately qualified person that key species identified for each reference site are present, as identified in Table A5– Reference Sites.
			Density of key plant species.	Certification by an appropriately qualified person that the density of the key species is consistent with that identified for each reference site identified in Table A5– Reference Sites.
			Composition of key plant species.	Certification by an appropriately qualified person that groundcover, shrub and canopy structure is similar or trending towards that of each reference site identified in Table A5– Reference Sites.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
		Establish self-sustaining natural vegetation or habitat (non-remnant vegetation areas).	Presence of key plant species.	Native grass species identified in the Post Mine Land Use Plan comprise at least 70% of total ground cover (or 50% if rocks, logs, or other features of cover are present).
			Density of key plant species.	Certification by an appropriately qualified person that tree density and height of >25 stems per 5 ha each being >2 m in height.
		Self-sustaining natural vegetation or habitat.	Native fauna species.	Certification by an appropriately qualified person that native fauna species identified within the Project Environmental Impact Statement and Supplementary Environmental Impact Statement are present or indicators of the of these species or key microhabitat elements are developing within the rehabilitated areas.
			Plant regeneration.	Species in rehabilitated areas show evidence of flowering, viable seed setting, germination and emergence.
			Abundance of declared plants (weeds) identified through surveys.	Certification by an appropriately qualified person that plants declared under local or State legislation are identified and eradicated within rehabilitation areas.
			Abundance of exotic grasses.	Certification by an appropriately qualified person that the abundance of exotic grass invasion is no greater than baseline condition as assessed against reference sites.
			Actions taken to eradicate plants declared under local or State legislation.	Evidence that actions have been undertaken to eradicate plants declared under local or State legislation.
			Abundance of declared animals identified through surveys.	Certification by an appropriately qualified person that the abundance of declared animals has not increased significantly since baseline surveys and/or that a vertebrate pest control program is being implemented to reduce pest numbers.

Domain	Rehabilitation Goal	Rehabilitation Objectives	Indicators	Completion Criteria
			Management actions taken to control animals declared under local or State legislation.	Records indicating that the holder has actively been managing animals declared under local or State legislation on the site.
			Weed hygiene procedures	Records indicating that all machinery, plant and equipment used for rehabilitation was free of declared plant seed and reproductive material prior to entering the site.
		Agricultural cattle grazing.	Cattle stocking rates.	Certification by an appropriately qualified person in the site Rehabilitation Report that areas nominated for cattle grazing are meeting and maintaining an equal to or better stocking rate than that calculated for each reference site. Reference sites will be identified following baseline survey of invasive exotic grasses.
			Landform stability when grazed.	Land maintenance requirements are comparable to designated reference sites. Safety of landform for stock and for undertaking management activities associated with stock.
			Stock access to water sources.	Stock only allowed access to water sources that meet stock water requirements as detailed in the EA.

NOTE: It is an offence under the *Land Protection (Pest and Stock Route* Management Act) 2002 to fail to control Class 1 or Class 2 pests on a Mining Lease or to move or transport a vehicle containing the reproductive material of a declared pest plant.

Table A2: Void Design Criteria

Mine Domain	Feature	Slope Range (degrees)	Approximate Surface Area (ha)
2	Voids – Pit 1 and Pit 2	Final void batter slopes will be designed and excavated to exhibit permanent geotechnical stability. Prior to closure, further investigations will be undertaken to specify design criteria and appropriate action will be taken to ensure effective long term safety, stability and management of the void	897

Table A3: Subsidence Design Criteria

Mine Domain	Feature	Subsidence panel slope (degrees)	Approximate Surface Area (ha)
5	Modelled significant SSBV impacted subsidence areas	To be confirmed	632
6	Underground mining areas.	To be confirmed	To be confirmed

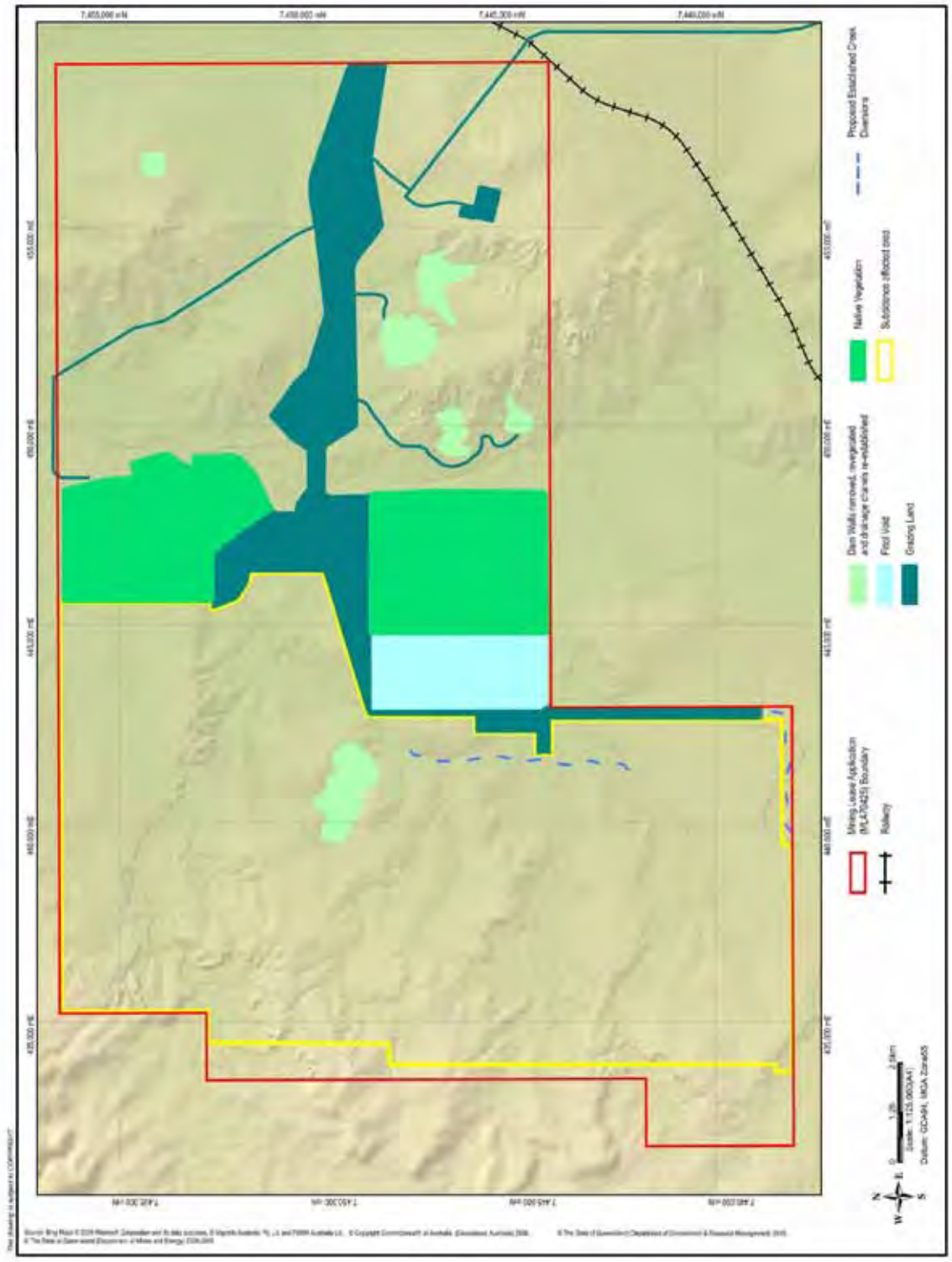
Table A4: Landform Design Criteria

Mine Domain	Feature	Slope Range (degrees)	Approximate Surface Area (ha)
1	Infrastructure including CHPP. workshops, landfill, administration areas.	No less than 75% of the rehabilitated area has slopes of less than 5° and up to 25% of the rehabilitated area has slopes greater than 5°.	2,566
2	Mine waste – borrow pit and overburden	No less than 75% of the rehabilitated area has slopes of less than 10°and up to 25% of the rehabilitated area has slopes greater than 10°	2,418
3	Tailings dam	No less than 75% of the rehabilitated area has slopes of less than 5° and up to 25% of the rehabilitated area has slopes greater than 5°.	420
4	Dams and surface water features	To be confirmed	360
5	Modelled significant SSBV impacted subsidence areas	To be confirmed	632
6	Other lands	To be confirmed	30,087

Table A5: Reference Sites

Reference Site	Mine Domain	Latitude (decimal degree, GDA94)	Longitude (decimal degree, GDA94)	Description
1	1,5	146.3232	-23.0081	10.3.27a
2	1,5	146.4148	-22.9769	10.3.27a
3	1,5	146.406	-22.9466	10.3.27a
4	1,5,6	146.33	-22.9421	10.5.12
5	1,5,6	146.4172	-22.953	10.5.12
6	1,5,6	146.3452	-22.9631	10.5.12
7	1,5	146.3982	-22.9514	10.3.13a
8	1,5	146.2879	-22.9378	10.3.13a
9	1,5	146.3277	-22.9353	10.3.13a
10	1,5	146.4069	-22.9647	10.3.28a
11	1,5	146.2882	-23.0274	10.3.28a
12	1,5	146.2999	-22.8676	10.3.28a
13	1,5,6	146.3277	-23.0109	10.3.3a
14	1,5,6	146.34	-23.0032	10.3.3a
15	1,5,6	146.295	-23.027	10.3.3a
16	1,5	146.5266	-23.0922	10.7.7
17	1,5	146.562	-23.103	10.7.7
18	1,5	146.5198	-23.0728	10.7.7
19	1,5,6	146.3657	-22.9483	10.7.3b
20	1,5,6	146.3469	-22.9332	10.7.3b
21	1,5,6	146.3329	-22.9482	10.7.3b
22	1,5,6	146.3273	-22.8714	10.5.5a
23	1,5,6	146.3003	-22.8507	10.5.5a
24	1,5,6	146.3278	-22.9467	10.5.5a
25	1	146.595	-23.1039	10.5.1c
26	1	146.536	-23.0957	10.5.1c
27	1	146.576	-23.0208	10.5.1c
28	1,6	146.3426	-22.9472	10.7.5
29	1,6	146.2866	-22.8468	10.7.5
30	1,6	146.3086	-23.0194	10.7.5
31	1	146.371	-22.9422	10.3.12a
32	1	146.3972	-22.9459	10.3.12a
33	1	146.4149	-22.9457	10.3.12a
34	5	146.3457	-22.8877	10.10.1b
35	5	146.3421	-22.9285	10.10.1b
36	5	146.2953	-23.0869	10.10.1b

Figure A1: Rehabilitated Final Landform



HANCOCK GALILEE PTY LTD

KEVINS CORNER PROJECT
DRAFT ENVIRONMENTAL AUTHORITY

REHABILITATION LOCATIONS

Attachment B – Watercourse Subsidence

When to use

This appendix is to be used by the Environmental Authority (EA) holders in the preparation of a Subsidence Management Plan (SMP) where a watercourse, as defined under the *Water Act 2000*, is to be impacted as a result of underground longwall mining. For a feature to be defined as a watercourse under Chapter 1, Part 2 of the *Water Act 2000,* the feature must possess particular characteristics. Watercourse determinations are regularly undertaken across Central Queensland by authorised departmental officers as it is the determining factor in the requirement for approvals under the *Water Act 2000*.

In addition, this appendix is to be used by the Department when providing advice and assessing Subsidence Management Plans submitted by EA holders or proposed EA holders.

Purpose

The purpose of this appendix is to detail the information to be provided in a SMP and the legislative basis of the requirement for approval. The SMP forms the major reference document regarding subsidence impacts on watercourses as a result of underground longwall mining and is required to accompany proposals for watercourse subsidence.

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, it is important for the situation to be managed effectively to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not impaired.

A SMP should include the following information:

- Location of proposed longwall panels and modelled subsidence effects on the watercourse;
- Pre-subsidence management of watercourses proposed to be subsided;
- Monitoring methods pre and post-subsidence to detect and document any impacts on watercourses;
- Post-subsidence management of impacted watercourses through remediation and rehabilitation;
- Agreed outcome for proposed future landscape between the Department and the proponent.

Governing legislation

Historically, subsidence on mining leases has been managed under two separate Government Departments; the Environmental Protection Agency (EPA) and Natural Resources and Water (NRW). Under the former EPA, subsidence within mining leases was conditional to the proponent's EA, however the impact on watercourses was not specifically addressed.

Now Departments are as one, regulation can be coordinated such as watercourse subsidence is authorised under specific conditions included in an EA issued under the *Environmental Protection Act 1994*. Works undertaken within the bed and banks of a

watercourse aimed at mitigating or remediating any physical impacts pre or post-subsidence are also authorised under the conditions of the EA. This guideline has been developed to assist the Department and proponents in undertaking a single collaborative process in the assessment and authorisation of proposals regarding subsidence of watercourses.

Environmental impact associated with mining activities is regulated under the *Environmental Protection Act 1994*. While this legislation does not identify longwall mining as a specific mining activity, it provides a definition of a 'mining activity' and 'environmental harm'. The process of longwall mining and resultant subsidence is governed by the legislation and authorised under a proponent's EA.

The holder or holders of a mining tenement issued under the *Mineral Resources Act 1989* must hold an EA for the mining activities to be carried out on the tenement. When applying for an EA, a number of environmental management documents must be in place describing the proposed project and the management of any environmental impacts.

An Environmental Management Plan (EM Plan) is a strategic document which provides information to support the application for an EA and proposes environmental protection commitments. It describes the project and surrounding environment, identifies relevant environmental values likely to be affected by the mining activities, outlines the potential adverse and beneficial impacts on environmental values and provides details on how the proposal will protect and enhance these values. Once an EA has been granted, a Plan of Operations is required.

A Plan of Operations describes the actions and programs required to achieve compliance with the conditions of an EA. It also describes the actions and programs required to achieve or implement the commitments contained in the relevant EM Plan. All activities carried out on a mining lease must be carried out in accordance with the submitted Plan of Operations. A Plan of Operations describes an action program for complying with the conditions of the associated EA and EM Plan, contains a plan showing where all activities are to be carried out on the land, and includes a rehabilitation program for land disturbed or proposed to be disturbed.

Whilst management of subsidence will be included in both the EM Plan and the Plan of Operations, the Subsidence Management Plan is a stand-alone document authorised under the conditions of the EA.

Background

Throughout the Bowen Basin, economically viable coal deposits frequently extend beneath watercourses. Consequently, underground mining operations targeting the associated coal seams often also extend beneath watercourses. Underground mining is not a new concept in the extraction of coal throughout the Bowen Basin. This form of mining is preferred when economical constraints reduce the feasibility of mining using open cut methods. Whilst coal deposits located beneath watercourses contribute to total extractable coal, more importantly, extraction of this coal facilitates underground mining activities to continue along a coal seam uninterrupted across both sides of a watercourse. This provides for a more cost effective extraction of coal that might otherwise be uneconomic to mine.

Technological improvements in underground mining methods have provided the ability to extract coal in areas previously inaccessible for mining. Modern day underground coal mining operations commonly utilise longwall mining techniques which allow extraction of more of the coal seam. Longwall mining allows access to the coal seam via a shaft, a decline or a highwall portal and system of underground workings, without the need to remove overburden. This technique is used to extract the coal seam via a series of “panels”, which can be hundreds of metres wide and kilometres in length. As the coal shearer removes the coal in the seam along the length of a panel, the overlying strata is collapsed behind, filling the void (goaf) left by the extracted coal. The collapse and settlement of the overlying strata can extend to the land surface above, resulting in localised lowering of the surface profile, and depressions in the landscape (commonly referred to as subsidence troughs).

Where a watercourse is located above a longwall panel, extraction of the coal seam causes subsidence of the panel can have a number of impacts on the watercourse. Some of these impacts include:

- Lowering of bed and banks
- Creation of in-stream waterholes
- Changes to local drainage patterns
- Incision processes
- Stream widening
- Erosion
- Increased overbank flows due to lowering of the high banks
- Tension cracking through both shallow and deeper underlying strata (including aquifers)
- Root shear and loss of riparian vegetation
- Changes to water quality (surface water and groundwater).

The degree of subsidence is generally a function of thickness of coal extracted, depth of overburden, strata type and panel width. The point of maximum subsidence generally occurs along the centreline of an extracted panel, whilst the pillar zones located between panels remain at natural surface level. Experience gained through widespread adoption of longwall mining processes in the Bowen Basin has seen advancement in the modelling and ability to predict the likely impacts of a subsidence event. This technology has also facilitated improved design and implementation of mitigation measures (engineered structures and associated earthworks) and highlighted potential short and long term maintenance issues which may require specific management intervention.

Subsidence Management Plan

The objective of the SMP is to ensure that the impacts of subsidence are properly managed. Where surface subsidence intersects a watercourse, effective management is required to ensure no long-term maintenance is required within the watercourse, and to ensure that naturally occurring processes are not unduly impaired. Consideration must be given for potential impacts on erosion, groundwater and surface water as a result of a proposed subsidence event.

A Subsidence Management Plan must address the following issues:

1. *Description of Pre Subsidence Situation & Survey*

    i) A general description of the area pre subsidence including photographic record should be provided.

    ii) Survey of cross-section and longitudinal profiles should be undertaken on all watercourses with potential to be impacted through subsidence. Permanent transects should be detailed within the proposed Subsidence Management Plan. Surveys should include the confluence with any other watercourses in the impacted area as well as any infrastructure spanning the watercourse. Surface drainage patterns should be investigated to determine current paths of water movement through the landscape. This path of water movement should be maintained where possible post-subsidence.

2. *Predicted Subsidence*

The degree of anticipated subsidence should be provided, including the length of watercourse to be impacted and the average depth of subsidence across individual panels. The predicted subsidence should be modelled to indicate the change in surface elevations expected. The volumes of water expected to be captured within the bed of the watercourse due to creation of waterholes should be provided. Consequences of any lowering of the high banks of the watercourse should be discussed, including impacts associated with greater floodplain interaction and potential for creation of new channels.

3. *Infrastructure*

Prior to mining, the anticipated impacts from subsidence should be determined on all infrastructure located within or above the watercourse to be subsided along with measures to be implemented to mitigate any impacts. Priority should be given to infrastructure which provides services to external parties (other mines, towns, industry). Measures for dealing with any interruption to such services should be outlined. Relocation of infrastructure may be necessary should the proposed subsidence pose sufficient risk.

4. *Preventative Works*

Where preventative measures are required to ensure the stability of the bed and banks of the watercourse (establishment of pile fields, exclusion of cattle, bentonite treatment) these should be discussed in the Subsidence Management Plan, including supporting evidence outlining the legitimacy of such works. These works may be required where self-repair by natural processes will not provide adequate remediation of impacted areas. Where there is potential for root shear to result in significant loss of riparian vegetation, mitigation measures may be required.

5. *Engineered Structures*

Engineered works may be required to maintain the stability and function of a watercourse impacted by subsidence. These works are often constructed prior to subsidence occurring within the watercourse. Such works can include timber pile fields, rock revetment, reshaping of existing stream banks, and river bed treatment to prevent increased ingress of surface water into underground aquifers. Where subsidence mitigation measures require engineered structures be installed, the design, monitoring and maintenance of these structures should be detailed in the Subsidence Management Plan. The plan should detail the purpose of each structure and any consequences should the structure fail to be installed. Appropriate design

plans including the location of each structure will be required. As a minimum, fourth and fifth order watercourse will require the installation of engineered structures. Works undertaken within the bed and banks of a watercourse aimed at mitigating or remediating any physical impacts pre or post-subsidence are authorised under the conditions of the Environmental Authority. Where a separate report has been produced for engineered structures, this should be included as an appendix to the Subsidence Management Plan.

6. *Erosion*

The Subsidence Management Plan should detail the current watercourse condition to be impacted by subsidence. Identification of erosion zones which are likely to be exacerbated through tension cracking should be stabilised using appropriate methods. Such areas may include reaches with elevated rates of bed and bank erosion, access tracks and areas with poor quality, sparsely populated riparian vegetation. Sufficient riparian vegetation should be established prior to subsidence to assist with initial stabilisation of the bed and banks. Removal of grazing animals to allow establishment or recovery of riparian vegetation may be required for an extended period prior to subsidence.

7. *Groundwater*

Where groundwater aquifers exist beneath the mine plan area, investigations should be undertaken regarding the potential for impacts on these aquifers as a result of subsidence. The Subsidence Management Plan should discuss these aquifers, any anticipated impacts on each aquifer and proposed measures for mitigating these impacts. Any anticipated movement of surface water into underlying aquifers should be discussed, as this can result in loss of surface water from the system and impacts on water quality in these aquifers. Geotechnical assessment across the bed and banks of the watercourse should be undertaken to provide an indication of potential permeability issues related to sub-surface cracking and interaction with local groundwater tables. Monitoring bores should be established in each aquifer prior to subsidence and monitored for a period of time sufficient for obtaining background water levels and trends. Monitoring of these bores should continue post-subsidence to aid the detection of impacted aquifers.

8. *Surface Water*

   i) *Baseline Monitoring*

      The Subsidence Management Plan should detail baseline condition monitoring of all watercourses likely to be impacted through subsidence. The preferred monitoring assessment technique for stream condition in the Bowen Basin is the Index of Diversion Condition. This methodology was established as a result of the Australian Coal Association Research Program (ACARP) Project C9068. Monitoring of watercourses should extend a minimum of 1km upstream and downstream of the proposed area to be impacted and should include a geomorphic assessment of the entire reach. Where a baseline monitoring assessment has been undertaken as part of an Environmental Impact Statement (EIS) process, this may be considered sufficient provided there has been no subsequent modification or interference to the watercourse. The condition of riparian vegetation should also be detailed.

   ii) *Cumulative Impacts on Watercourses*

      With an increasing number of mines being established in close proximity to watercourses, a proponent utilising longwall mining methods may be requested to investigate the cumulative impact of these activities on the watercourse.

Monitoring and Reporting Requirements

The following criteria have been developed to provide detailed direction regarding monitoring and reporting requirements associated with subsidence of watercourses.

These criteria are outlined in a four step approach:

- Monitoring
- Assessment
- Reporting
- Mitigation

Monitoring

- Representative sites need to be identified that allow the impacts of subsidence to be assessed in a particular watercourse with particular attention to the following:
    - Sites must be located at all pillar zones intersecting a watercourse or tributary.
    - Sites must include representative locations at the interface of natural ground level and observed changes in surface elevation from subsidence within a watercourse.
- Control sites beyond proposed mining extents should be established to verify pre-mining conditions. In watercourses, the sites should extend a minimum of 1km both upstream and downstream of the subsidence reach.
- Assessment of watercourse condition: Specific monitoring assessment techniques for watercourse condition should include but not be limited to the Index of Diversion Condition, as outlined in the ACARP Project C9068.
- Vegetation and ecological condition assessments should form part of the baseline dataset.
- Rainfall monitoring should be undertaken within areas proposed to be impacted by subsidence. In addition, flow event monitoring should occur in watercourses proposed to be impacted by subsidence. The type of monitoring devices and locations to be installed should be detailed in the Subsidence Management Plan.
- Where preventative works are undertaken pre-subsidence, subsequent monitoring assessments should include the integrity and effectiveness of these works in reducing the impact of subsidence within the watercourse.
- Surveys must include cross-sectional area and bed slope throughout all monitored reaches of impacted watercourses.
- Annual aerial photography and Digital Terrain Mapping is required to verify predicted subsidence surface profiles, and to identify potential short and long term erosion issues resulting from subsidence of watercourses.
- Surveys pre-subsidence should quantify the following features within watercourses:
    - pool/riffle sequences
    - bed controls
    - entry points of other watercourses and localised tributaries

- existing bed and bank scour points
- infrastructure located within the watercourse.

- Surveys post-subsidence should quantify any changes to the pre-mining conditions including:
  - erosion or deposition processes that have occurred as a result of subsidence,
  - migration of head cut erosion within watercourses and tributaries,
  - localised changes to stream bed slope,
  - localised widening of channels,
  - destabilisation of stream bed and banks including fracturing and incision,
  - localised changes to bank heights
  - size of subsidence void created within the watercourse.
- The subsidence monitoring program for groundwater must include the following information:
  - Sites must include representative locations at the interface of natural ground surface and observed changes in surface elevation from subsidence.
  - Monitoring bores should be established in each aquifer at each monitoring site.
  - Monitoring must include both water level measurements and water quality sampling in accordance with the following:
    - water level measurement to be taken quarterly
    - water quality field conductivity measurement to be taken 6 monthly
    - full chemical analysis of water samples to be taken annually.

Frequency of Monitoring

A proposed timeframe should be provided by the proponent in relation to the monitoring outlined in the Subsidence Management Plan. The Department, upon review of the proposed Subsidence Management Plan will determine a suitable monitoring timeframe based on the information provided. Monitoring requirements will depend on a number of factors, including the stream order of the watercourse proposed to be impacted. As a guide:

Stream Order 1, 2 and 3

Monitoring must be undertaken at the following intervals:

- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 2 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 2 year** ARI and
- annually.

Stream Order 4 and higher

Monitoring (including surveys) must be undertaken at the following intervals:

- immediately prior to subsidence,
- within two (2) months of the initial subsidence,
- following a rainfall event of **1 in 5 year** ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence.
- following a peak flow event of greater than a **1 in 5 year** ARI, and
- annually.

Cumulative Impacts

Where subsidence is proposed in a Subsidence Management Plan, and the watercourse has already been subsided upstream or downstream, the monitoring assessment must determine not only the localised impacts on the watercourse resulting from the proposed subsidence, but also any cumulative impacts on the watercourse as a result of all other subsidence events.

Assessment

The design and assessment of engineered structures should be performed by a Registered Professional Engineer of Queensland (RPEQ). All other assessments should be performed by suitably qualified and experienced persons in the fields that they are assessing.

- The results of all monitoring activities should be reviewed by a suitably qualified person and detailed in the associated monitoring report.
- Recommendations should be made after assessment of the results regarding any specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse.

Reporting

An annual report will be requested by the administering authority post-subsidence. The report should detail mining activities and all monitoring and rehabilitation activities as outlined within the Subsidence Management Plan. The reporting date will be determined in consultation with the administering authority.

- A monitoring report should contain the results of all monitoring activities, the assessment of these results, and recommendations for any remedial works required. The report should comment on the following:
    - Watercourse condition and geomorphic processes;
    - The condition of vegetation in riparian zones;
    - Examination of pillar zones in watercourses with particular attention to potential for tension cracking;
    - The creation of in-stream waterholes;
    - Any impacts on groundwater.
- Where preventative works were undertaken pre-subsidence, subsequent monitoring assessments should include assessment of the integrity and effectiveness of these works in mitigating the impacts of subsidence.

- An annual report in the form of two (2) hard copies and one electronic copy shall be furnished to the administering authority. The report should in addition to addressing specific monitoring requirements provide comment on:
    - The current state of the groundwater and surface water resources;
    - Any impacts on these features;
    - Any remedial works required to be undertaken including a timetable for implementation.
    - Commitment from the proponent to addressing the recommendations in the report.

Mitigation

Where recommendations are made regarding specific treatment, remediation works, or engineered structures required post-subsidence to achieve stability in the watercourse, the proponent must ensure this work is undertaken.

Rehabilitation

The holder of the EA, if directed by the administering authority, will carry out additional remedial works deemed necessary to minimise the impacts of subsidence on the physical integrity of the watercourse.

Relinquishment

Relinquishment of monitoring and rehabilitation responsibilities conditional under a proponent's EA can only occur after the subsidence and approved mitigation and rehabilitation measures have been subjected to a suitable range of rainfall and flow events, and are deemed by the administering authority to be in a stable and functional condition. Any request for relinquishment will be negotiated with the administering authority and will require a submission containing monitoring data demonstrating stability and functionally in the watercourse over a suitable range of rainfall and flow events.

Acknowledgement

In 2007, BMA and Anglo Coal instigated discussions with the Department into a proposed assessment on the cumulative impacts of longwall mining beneath the Isaac River in Central Queensland. A final report was produced by Alluvium Consulting in July 2009 documenting the outcomes of the study. The Department greatly acknowledges the findings from this report and the assistance provided in the development of this guideline.

R Lucas, J Crerar, R Hardie, J Merritt and B Kirsch, 2009. *Isaac River Cumulative Impact Assessment of Mining Developments*. Report by Alluvium Consulting. ACARP for Diversion assessment guideline ex C9068

Appendix 2. Conditions - off-lease rail spur and access road

Introduction

This Appendix relates to those components of the project located off the mining lease and is comprised of two parts:

- **Part A**: relates to the construction and operation of the 2km section of rail spur
- **Part B**: relates to the construction of the 8km mine access road

Part A. Rail Spur

At this stage of the project evaluation a decision does not need to be made regarding the preferred statutory instrument regulating the construction and operation of the rail spur. The regulatory framework applying to conditions and/or recommendations for the rail spur will vary depending on the statutory instrument selected.

Accordingly, Part A of this Appendix is structured to each of the following statutory instrument scenarios for the rail spur:

- Jericho Planning Scheme under the SPA – Part A of this Appendix sets out the stated conditions in accordance with section 39 of the SDPWO Act;
- Community Infrastructure Designation under the SPA – Part A of this Appendix sets out the recommendations under section 43 of the SDPWO Act; and
- State Development Area under the SDPWO Act – Part A of this Appendix sets out the recommendations under section 52 of the SDPWO Act.

Condition 1. Compliance auditing and performance review

Third Party Auditor

(a) An assessment of compliance with conditions (a *compliance audit*) of this approval in respect of the rail project must be carried out in accordance with *AS/NZS ISO 19011:2003 Guidelines for quality and/or environmental management systems auditing* by a person (an *auditor*) who is suitably qualified and independent.

Frequency of auditing

(b) An audit report under subsection (a) must be submitted to the administering authority:

(i) within three months of commencement of construction of the railway of the rail project and six monthly thereafter during construction, and

(ii) within three months of commencement of operation of the railway of the rail project and at least every five years thereafter during operation.

Conducting follow-up audit

(c) If an audit report makes recommendations for, but not limited to, corrective and/or preventative action, a follow up compliance audit must be conducted by an auditor under subsection (a) and a report (a *follow up audit report*) must:

(i) be submitted to the administering authority, within 30 days after completion of implementing the recommendations, and

(ii) verify the completion and effectiveness of the recommendations.

Declaration to accompany an audit report

(d) An audit report and follow up audit report submitted to the administering authority must be accompanied by a statutory declaration made -

(i) if the auditor is an individual- by the individual, or

(ii) if the auditor is a corporation- by an executive officer of the corporation.

(e) A statutory declaration made by the auditor must state the following:

(i) that the auditor has not knowingly included false, misleading or incomplete information in the audit report;

(ii) that the auditor has not knowingly failed to reveal any relevant information or document to an administering authority;

(iii) the audit report addresses the relevant matters for evaluating compliance with the conditions of the Coordinator-General's report and is factually correct;

(iv) the opinions expressed in the audit report are honestly and reasonably held.

Financial costs of audits

(f) The proponent or whoever carries out the rail project must pay the costs incurred in-

(i) a compliance audit; and

(ii) an audit report; and

(iii) a follow up audit report.

Condition 2. Environmental management plans (EMP)—Construction and Operation

(a) Three months before the commencement of any construction work for the rail project, a Construction EMP (the *CEMP*) for all construction activities of the rail project must be developed and a copy submitted to the administering authority.

(b) Three months before the railway of the rail project is scheduled to commence operations, an Operational EMP (the *OEMP*) for the operation of the railway of the rail project must be developed and a copy submitted to the administering authority.

(c) The CEMP and OEMP must be developed and implemented in accordance with, but not limited to, *Hancock Galilee Pty Ltd – Kevin's Corner Project Environmental Impact Statement (*the ***environmental impact report****)* submitted to the Coordinator-General in 2011 and -

(i) any supplementary report to the environmental impact report; and

(ii) the Off-lease EMP dated May 2013; and

(iii) the updated Proponent Commitment Register (May 2013); and

(iv) any relevant best practice environmental management document.

Management plan

(d) Each of the CEMP and the OEMP must include a sub-plan (a ***management plan***) for each of, but not limited to, the following:

(i) lighting and visual amenity

(ii) soils, erosion and sediment control

(iii) native flora and fauna—*with respect, but not limited to, terrestrial ecosystems and aquatic ecosystems, including vegetation communities, and loss of fauna habitats.*

(iv) fauna passage—*with respect, but not limited, to the free movement of local terrestrial and aquatic fauna across the rail corridor.*

(v) weeds and pests

(vi) surface waters—*with respect, but not limited, to rivers and creeks including ephemeral streams and groundwater and quality of water on land and the quantity and quality of water storages used for farming and agricultural purposes.*

(vii) surface flood waters—*with respect, but not limited, to maintaining and protecting the natural and existing hydraulic processes (drainage or overland flow) in relation to preconstruction conditions of the land and its existing surface waters and flooding characteristics.*

(viii) dust and air quality—*with respect, but not limited, to vegetation clearing, earthworks, road dust from vehicle movements.*

(ix) coal dust—*with respect, but not limited to, coal dust from haulage trains*

(x) noise and vibration

(xi) waste management

(xii) stock routes—*with respect, but not limited, to interference and/or alteration of stock route crossings*

(xiii) agricultural land integrity—*with respect, but not limited to, disruption to existing agricultural land use of the Surbiton South property.*

(xiv) existing transport and utility infrastructure

(xv) rehabilitation of disturbed areas—*including, but not limited to, protection of topsoil.*

(xvi) non-Indigenous cultural heritage—*including, but not limited to, an archaeological management plan*

(xvii) decommissioning and rehabilitation

(xviii) hazard and risk

(e) Each management plan must be developed and implemented in accordance with, but not limited to:

(i) the environmental impact report; and

(ii) any supplementary report to the environmental impact report; and

(iii) the Off-lease EMP dated May 2013; and

(iv) the updated Proponent Commitment Register (May 2013); and

(v) any relevant best practice environmental management document.

Content of management plan

(f) A management plan must state all of, but not limited to, the following-

(i) management objectives;

(ii) performance criteria;

(iii) implementation strategies;

(iv) monitoring and auditing;

(v) reporting;

(vi) corrective actions.

All reasonable and practicable measures be taken

(g) All reasonable and practicable measures to prevent or minimise the environmental impacts to the greatest extent practicable must:

(i) be included in each management plan, and

(ii) be taken.

(h) If an aspect of an environmental impact is not prevented or minimised to the greatest extent practicable, in the opinion of the chief executive of the administering authority, the relevant management plan must be:

(i) amended to include all reasonable and practicable measures in the circumstances current at that time, and

(ii) implemented.

(i) To remove any doubt, a management plan of the CEMP or the OEMP of which a copy has been submitted to the administering authority does not limit the application of subsection (h) if particular circumstances at the time of that submission to the administering authority have changed.

References in environmental impact report and its supplementary report and conditions for the rail project

(j) A document reference in the environmental impact report and any supplementary report to the environmental impact report and in these conditions for the rail project must be taken to be a reference to the most recent version or current edition of the document.

Examples of a document reference:

- QR Network (2010), *Coal Dust Management Plan* (CDMP)
- International Erosion Control Association (IECA) Australasia 2013, *Best Practice Erosion and Sediment Control*
- Queensland Environmental Protection Agency (2000) – *Noise Measurement Manual* (Third edition)

Condition 3. Publication of documents on website

(a) The proponent or whoever carries out the rail project must have a website and must publish for a duration of not less than seven years on that website the following within the specified timeframes:

(i) the CEMP—within one month of being finalised

(ii) the OEMP—within one month of being finalised

(iii) a management plan amended under subsection (h) of Condition 2. —within one month of being finalised

(iv) an audit report—within one month of being finalised

(v) a follow up audit report—within one month of being finalised.

Part A Definitions

administering authority means-

(1) if the land is designated for community infrastructure under Chapter 5 of the *Sustainable Planning Act 2009*—the relevant Minister; or

(2) if the land is declared under the State Development and Public Works Organisation Act 1971 to be a state development area—the Coordinator-General, or

(3) for any land requiring approvals under the Sustainable Planning Act 2009—Barcaldine Regional Council.

best practice environmental management document means-

(4) any guideline, standard, code of practice, control plan, manual or other publicly available document, however called, that proposes practices, procedures, processes, measures or mechanisms to achieve prevention or an ongoing minimisation of any aspect of the potential environmental impact of the activity; and

(5) is published by a recognised professional organisation or local government.

Kevin's Corner project means the development declared by the Coordinator-General to be a 'coordinated project' under the *State Development and Public Works Organisation Act 1971*.

management plan means:

(6) an environmental management document, or

(7) another document, however called, that proposes conditions and mechanisms to manage the potential environmental impact of the project.

rail project means the construction and operation of the railway and all supporting and associated activities of the construction and operation of that railway that are part of the Kevin's Corner project excluding the activities within the mining lease area as shown in Figure 2-1 Off-lease Road & Rail Infrastructure in the Supplementary Environmental Impact Statement 2012 that is identified as Appendix T2, Off-lease EMP.

Part B. Mine access road

This appendix includes stated conditions under section 39 of the SDPWO Act as they relate to applications for development approvals for the mine access road component of the Kevin's Corner project.

Condition 1. Compliance auditing and performance review

Third Party Auditor

(a) An assessment of compliance with conditions (a *compliance audit*) of this approval in respect of the road project must be carried out in accordance with *AS/NZS ISO 19011:2003 Guidelines for quality and/or environmental management systems auditing* by a person (an *auditor*) who is suitably qualified and independent.

Frequency of auditing

(b) An audit report under subsection (a) must be submitted to the administering authority within three months of commencement of construction of the road project and six months after construction has been completed.

Conducting follow-up audit

(c) If an audit report makes recommendations for, but not limited to, corrective and/or preventative action, a follow up compliance audit must be conducted by an auditor under subsection (1) and a report (a *follow up audit report*) must:

  (i) be submitted to the administering authority, within 30 days after completion of implementing the recommendations, and

  (ii) verify the completion and effectiveness of the recommendations.

Declaration to accompany an audit report

(d) An audit report and follow up audit report submitted to the administering authority must be accompanied by a statutory declaration made:

  (i) if the auditor is an individual—by the individual, or

  (ii) if the auditor is a corporation—by an executive officer of the corporation.

(e) A statutory declaration made by the auditor must state the following-

  (i) that the auditor has not knowingly included false, misleading or incomplete information in the audit report

  (ii) that the auditor has not knowingly failed to reveal any relevant information or document to an administering authority

  (iii) the audit report addresses the relevant matters for evaluating compliance with the conditions of the Coordinator-General's report and is factually correct

  (iv) the opinions expressed in the audit report are honestly and reasonably held.

Financial costs of audits

(f) The proponent or whoever carries out the road project must pay the costs incurred in:

  (i) a compliance audit, and

  (ii) an audit report, and

(iii) a follow up audit report.

Condition 2. Environmental management plans (EMP)—Construction

(a) Three months before the commencement of any construction work for the road project, a Construction EMP (the ***CEMP***) for all construction activities of the road project must be developed and a copy submitted to the administering authority.

(b) The CEMP must be developed and implemented in accordance with, but not limited to, *Hancock Galilee Pty Ltd – Kevin's Corner Project Environmental Impact Statement (the **environmental impact report**)* submitted to the Coordinator-General in 2011 and:

(i) any supplementary report to the environmental impact report; and

(ii) the Off-lease EMP dated May 2013; and

(iii) the updated Proponent Commitment Register (May 2013); and

(iv) any relevant best practice environmental management document.

Management plan

(c) The CEMP must include a sub-plan (a ***management plan***) for each of, but not limited to, the following:

(i) lighting and visual amenity

(ii) soils, erosion and sediment control

(iii) native flora and fauna—*with respect, but not limited, to terrestrial ecosystems and aquatic ecosystems, including vegetation communities, and loss of fauna habitats.*

(iv) fauna passage—*with respect, but not limited, to the free movement of local terrestrial and aquatic fauna across the rail corridor.*

(v) weeds and pests

(vi) surface waters—*with respect, but not limited, to rivers and creeks including ephemeral streams and groundwater and quality of water on land and the quantity and quality of water storages used for farming and agricultural purposes.*

(vii) surface flood waters—*with respect, but not limited, to maintaining and protecting the natural and existing hydraulic processes (drainage or overland flow) in relation to preconstruction conditions of the land and its existing surface waters and flooding characteristics.*

(viii) dust and air quality—*with respect, but not limited, to vegetation clearing, earthwork and road dust from vehicle movements.*

(ix) noise and vibration

(x) waste management

(xi) stock routes—*with respect, but not limited, to interference and/or alteration of stock route crossings*

(xii) existing transport and utility infrastructure

(xiii) rehabilitation of disturbed areas—*including, but not limited to, protection of topsoil.*

(xiv) non-Indigenous cultural heritage—*including, but not limited to, an archaeological management plan*

(xv) decommissioning and rehabilitation

(xvi) hazard and risk.

(d) Each management plan must be developed and implemented in accordance with, but not limited to-

(i) the environmental impact report; and

(ii) any supplementary report to the environmental impact report; and

(iii) the Off-lease EMP dated May 2013; and

(iv) the updated Proponent Commitment Register (May 2013); and

(v) any relevant best practice environmental management document.

Content of management plan

(e) Each management plan must state all of, but not limited to, the following:

(i) management objectives

(ii) performance criteria

(iii) implementation strategies

(iv) monitoring and auditing

(v) reporting

(vi) corrective actions.

All reasonable and practicable measures be taken

(f) All reasonable and practicable measures to prevent or minimise the environmental impacts to the greatest extent practicable must:

(i) be included in each management plan, and

(ii) be taken.

(g) If an aspect of an environmental impact is not prevented or minimised to the greatest extent practicable, in the opinion of the chief executive of the administering authority, the relevant management plan must be:

(i) amended to include all reasonable and practicable measures in the circumstances current at that time, and

(ii) implemented.

(h) To remove any doubt, a management plan of the CEMP of which a copy has been submitted to the administering authority does not limit the application of subsection (g) if particular circumstances at the time of that submission to the administering authority have changed.

References in environmental impact report and its supplementary report and conditions for the road project

(i) A document reference in the environmental impact report and any supplementary report to the environmental impact report and in these conditions for the road project

must be taken to be a reference to the most recent version or current edition of the document.

Examples of a reference:

- Queensland Environmental Protection Agency (2000), *Noise Measurement Manual* – Third Edition
- International Erosion Control Association (IECA) – Australasia 2013 – *Best Practice Erosion and Sediment Control*
- Queensland Environmental Protection Agency (1997) – *Air Quality Sampling Manual*.

Condition 3. Publication of documents on website

(a) The proponent or whoever carries out the road project must have a website and must publish for a duration of not less than seven years on that website the following within the specified timeframes:

(i) the CEMP—within one month of being finalised

(ii) a management plan amended under subsection (g) of Condition 2—within one month of being finalised

(iii) an audit report—within one month of being finalised

(iv) a follow up audit report—within one month of being finalised.

Part B Definitions

administering authority means:

(8) if the land is designated for community infrastructure under Chapter 5 of *Sustainable Planning Act 2009*—the relevant Minister; or

(9) if the land is declared under the *State Development and Public Works Organisation Act 1971* to be a state development area—the Coordinator-General, or

(10) for any land requiring approvals under the Sustainable Planning Act 2009—Barcaldine Regional Council.

best practice environmental management document means-

(11) any guideline, standard, code of practice, control plan, manual or other publicly available document, however called, that proposes practices, procedures, processes, measures or mechanisms to achieve prevention or an ongoing minimisation of any aspect of the potential environmental impact of the activity; and

(12) is published by a recognised professional organisation or local government.

Kevin's Corner project means the development declared by the Coordinator-General to be a 'coordinated project' under the *State Development and Public Works Organisation Act 1971*.

management plan means:

(13) an environmental management document, or

(14) another document, however called, that proposes conditions and mechanisms to manage the potential environmental impact of the project.

road project means the construction and/or upgrading of roads that are part of the Kevin's Corner project as shown in Figure 2-1 Off-lease Road & Rail Infrastructure in the Supplementary Environmental Impact Statement 2012 that is identified as Appendix T2, Off-lease EMP.

Appendix 3. Imposed conditions

This appendix includes conditions imposed by the Coordinator-General under section 54B of the SDPWO Act.[59] The conditions are relevant to applications for development approvals for those parts of the project where there is no relevant approval applicable under other legislation.

All of the conditions imposed in this appendix take effect from the date of this Coordinator-General's report.

These conditions do not relieve the proponent of the obligation to obtain all approvals and licences from all relevant authorities required under any other Act.

In accordance with section 54B(3) of the SDPWO Act, I have nominated several entities to have jurisdiction for the conditions in this schedule.

Pursuant to section 54D of the SDPWO Act, these conditions apply to anyone who undertakes the project, such as the proponent and an agent, contractor, subcontractor or licensee of the proponent, and any public utility providers undertaking public utility works as a result of the project.

Condition 1. Social impact assessment reporting requirements

The proponent will provide an annual report to the Coordinator-General from the commencement of construction up to and including the peak construction workforce period, and for two years following the commencement of mining operations describing:

(a) the actions and adaptable management strategies to avoid, manage or mitigate project-related impacts on local and regional housing markets

(b) the actions to enhance local employment, training and development opportunities

(c) the actions to avoid, manage or mitigate project-related impacts on local community services, social infrastructure and community safety and wellbeing

(d) the actions to inform the community about project impacts and show that community concerns about project impacts have been taken into account when reaching decisions.

The Coordinator-General is responsible for this condition.

[59] For a definition of 'imposed conditions', refer to the Glossary on page 442 of this report.

Condition 2. Proponent contribution to regional water balance modelling, monitoring and assessment programs

To address potential cumulative impacts on water resources in the Belyando-Suttor sub-catchment and aquifers of the eastern part of the Galilee Basin,[60] the proponent must, when requested by the administering authority:

(a) prepare, to the satisfaction of the administering authority, a groundwater and surface water monitoring and reporting program that takes into account requirements of any regional groundwater and surface water monitoring and assessment program developed in Recommendation 9, Appendix 4 of this report

(b) provide monitoring results in the format and at intervals specified in the protocol for coordination of regional groundwater and surface water monitoring data to the lead agency for the program Recommendation 9, Appendix 4 of this report

(c) make monitoring results from the project surface water and groundwater program publicly available on the proponent's website within six months of collection

(d) contribute to the ongoing operation of the regional groundwater and surface water monitoring and assessment program Recommendation 9, Appendix 4 of this report including pro-rata funding.

DNRM is designated as the agency responsible for this condition.

Condition 3. Apportionment of pro-rata funding—regional water balance modelling, monitoring and assessment programs

The apportionment of pro-rata funding pursuant to Condition 2(d) will be determined by the Coordinator-General in consultation with:

(a) Galilee Basin[60] proponents of projects that have been declared Coordinated Projects under *the State Development and Public Works Organisation Act 1971*

(b) Galilee Basin[60] proponents that have made an application for a mining lease or petroleum lease

(c) The Department of Natural Resources and Mines

(d) The Department of Environment and Heritage Protection

(e) The Department of State Development, Infrastructure and Planning.

The Coordinator-General is responsible for this condition.

[60] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.

Appendix 4. Coordinator-General's recommendations

Schedule 1. Recommendations for other approvals

Appendix 4, Schedule 1 includes recommendations made under section 52 of the SDPWO Act. The recommendations relate to Acts other than the *Sustainable Planning Act 2009* or the *Environmental Protection Act 1994*, Chapter 4A or 5, which require the preparation of an EIS, or a similar statement to address environmental effects, for the project.

While the recommendations guide the assessment managers[61] in assessing the development applications, they do not limit their ability to seek additional information or power to impose conditions on any development approval required for the project.

Each recommendation nominates the entity to be consulted by the proponent.

Part A. Extraction and use of groundwater under the *Water Act 2000*

Recommendation 1. Water security

(a) Prior to the commencement of mining activities, the proponent must develop to the satisfaction of the administering authority for the *Water Act 2000*, a plan to address the short and long term implications for groundwater users of dewatering for the following:

(i) Clematis Sandstone

(ii) Bandanna Formation

(iii) Colinlea Sandstone

(iv) Rewan Formation

(v) Alluvium deposits;

(vi) Tertiary deposits.

(b) The plan in Recommendation 1(a) must provide for actions for the assurance of the long-term security of water for all current groundwater users affected by the project.

DNRM is designated as the agency responsible for this recommendation.

Recommendation 2. Groundwater level monitoring plan

(a) Prior to the commencement of mining activities, the proponent must present a groundwater level monitoring plan for acceptance by the administering authority for the *Water Act 2000* in relation to the groundwater level monitoring to be conducted during mine construction and operations. The plan must include existing water level monitoring locations, aquifer accessed by each bore and proposed frequency of monitoring.

[61] For a definition of 'assessment manager' refer to the Glossary on page 442 of this report.

(b) Prior to the commencement of operational mine dewatering, the proponent must present an amended groundwater level monitoring plan for acceptance by the administering authority. The amended plan must:

(i) monitor any ongoing impacts of the mine dewatering

(ii) contain, as a minimum, 3 bores in the Rewan Formation and 2 bores in the Clematis Sandstone.

(c) The Clematis bores are to be positioned such that they provide early warning of any potential changes in groundwater levels caused by the proponent's operations.

(d) Within 12 months of the amended groundwater level monitoring plan being accepted by the administering authority, the monitoring bores in the Rewan Formation and the Clematis Sandstone must be drilled and monitoring of water levels commenced by automated means.

DNRM is designated as the agency responsible for this recommendation.

Recommendation 3. GAB aquifer trigger levels

(a) After 12 months of groundwater monitoring data has been obtained and analysed from monitoring bores in the Rewan Formation and Clematis Sandstone (pursuant to Recommendation 2(d)), the proponent must present for acceptance by the administering authority lower and upper trigger levels.

(b) If, after an allowance for seasonally adjusted levels, the lower trigger level (low impact) is reached in any Rewan Formation or Clematis Sandstone bore, the proponent must notify the administering authority within 30 days and conduct an investigation of the causes of the lower water levels.

(c) If the upper trigger level (high impact) is reached in any Rewan Formation or Clematis Sandstone bore, the proponent must complete an independent investigation to determine the cause and provide a written report to the administering authority within 30 days.

(d) If found to be caused by the proponent operations, the proponent must fully investigate and model the potential impact upon the Great Artesian Basin and obtain any necessary approvals as a result.

(e) If the upper trigger level is reached the proponent may be required to construct additional monitoring bores.

DNRM is designated as the agency responsible for this recommendation.

Part B. Approvals under the *Transport Infrastructure Act 1994*

Recommendation 4. Pre-construction roadworks (related Act: *Transport Infrastructure Act 1994*, s. 33)

Prior to the commencement of any significant construction relating to project mining activities, the proponent must finalise construction of any required road works.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 5. Traffic impacts on railway crossing *(related Act: Transport Infrastructure Act 1994*, s. 255*)*

(a) Prior to the commencement of any significant project-related construction, an infrastructure agreement must be concluded between the proponent, DTMR, Barcaldine Regional Council and Queensland Rail relating to the level crossing on Clermont-Alpha Road over the Western Rail line.

(b) The proponent must implement all of the proposals (Proposals 1 to 12) included in the Queensland Rail *Desktop Assessment Proposals for Pedestrian Crossing Protection in the Barcaldine Local Government Authority, 9 May 2012* assessment of the level crossing on Clermont-Alpha Road over the Western Rail line.

(c) An audit inspection of this crossing by Queensland Rail must be undertaken following the implementation of the proposals identified in under (b), in order to confirm compliance with the AS1742.7-2007 and related standards.

DTMR is designated as the agency responsible for this recommendation.

Part C. Approvals under the *Nature Conservation Act 1992*

Recommendation 6. Species management plans

(a) In order to maximise the ongoing protection and long-term conservation of threatened species known or likely to occur within the project area, prior to construction, the proponent should submit for approval of the administering authority, Species Management Plans (prepared in accordance with the provisions of the *Nature Conservation Act 1992* (Qld)) for protected animals listed in Table 3. Species requiring a Species Management Plan

Table 3. Species requiring a Species Management Plan

Species	NC Act status
Squatter pigeon (*Geophaps scripta scripta*)	Vulnerable
Square-tailed kite *(Lophoictinia isura)*	Near Threatened
Cotton pygmy-goose *(Nettapus coromandelianus*	Near Threatened
Koala *(Phascolarctos cinereus)*	Special Least Concern
Red goshawk *(Erythrotriorchis radiatus)*	Endangered
Ornamental snake *(Denisonia maculata*)	Vulnerable
Yakka skink *(Egernia rugosa)*	Vulnerable
Brigalow scaly foot *(Paradelma orientalis)*	Vulnerable
Capricorn ctenotus *(Ctenotus capricorni)*	Near Threatened
Black-chinned honeyeater *(Melithreptus gularis)*	Near Threatened
Black-throated finch (southern) *(Poephila cincta cincta)**	Endangered

(b) Each Species Management Plan must:

(i) Identify relevant guidelines, policies and plans

(ii) detail species' on-site habitat requirements

(iii) identify specific impacts on that species during each project phase and how impacts will be avoided and/or mitigated and managed. Impacts must include relevant direct and indirect impacts of the project, including but not limited to:

(A) vegetation clearing for open-cut mining and infrastructure areas

(B) subsidence from underground mining

(C) mine dewatering impacts on perched aquifers

(D) hydrological changes due to stream diversions and flood levees

(E) weeds and pests

(iv) identify relevant site rehabilitation measures, timeframes, standards and methods

(v) identify specific monitoring and reporting requirements to be implemented

(vi) specify performance criteria to be achieved through implementation of the Species Management Plan.

(c) Where species share similar habitat preferences and management requirements, Species Management Plans for multiple species, such as migratory bird species, may be combined into one Species Management Plan.

The Department of Environment and Heritage Protection is the agency responsible for this recommendation.

Schedule 2. General recommendations

Part A. Cumulative water impacts

Recommendation 7. Regional water balance model

(a) To address potential cumulative impacts on water resources in the Belyando-Suttor sub-catchment and the aquifers of the eastern part of the Galilee Basin,[62] the authority responsible for administering the *Water Act 2000* should ensure the development and maintenance of a numerical regional water balance model for the Galilee Basin. The regional water balance model should:

(i) include the identification of linkages between hydrogeological formations, the likely extent of aquifer connectivity and groundwater/surface water interactions, and characteristics of aquifer recharge

(ii) have regard to baseline monitoring and site water balance model data provided by project proponents

(iii) have regard to relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin

(iv) determine potential impacts on groundwater resources in the eastern Galilee Basin

(v) determine potential impacts on surface water flow conditions, environmental values and existing surface water users

(vi) make results publicly available on the administering authority's website.

DNRM is designated as the agency responsible for this recommendation.

Recommendation 8. Local water quality objectives

(a) To address the potential cumulative impacts on surface water quality in the Belyando-Suttor sub-catchment and aquifers of the eastern part of the Galilee Basin,[63] the authority responsible for administering the *Environmental Protection Act 1994* should:

(i) develop Belyando-Suttor sub-catchment environmental values and water quality objectives for the Galilee Basin. Water quality objective development should also have regard to, where available:

(A) impact assessment, baseline monitoring and site water balance model data provided by project proponents

(B) results of the regional water balance model (Recommendation 7) and any ongoing regional surface water and groundwater monitoring and assessment program (Recommendation 9)

(C) relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin

[62] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.
[63] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.

(ii) develop model water conditions for coal mines and coal seam gas projects in the Galilee Basin to form the basis of Environmental Authority conditions and any other related decisions the administering authority under the *Environmental Protection Act 1994* may be required to make in relation to cumulative impacts on water quality.

DEHP is designated as the agency responsible for this recommendation.

Recommendation 9. Regional groundwater and surface water monitoring and assessment program

(a) To address potential cumulative impacts on water resources in the Belyando-Suttor sub-catchment and aquifers of the eastern part of the Galilee Basin,[64] the DNRM should, in consultation with DEHP and Galilee Basin mine proponents, ensure the development of an ongoing fit for purpose regional groundwater and surface water monitoring and assessment program with reference to existing water users and the maintenance of environmental values. The monitoring and assessment program should:

(i) establish a protocol with coal mine and coal seam gas proponents for delivery of surface water and groundwater monitoring data recorded by proponents in accordance with Environmental Authority and Coordinator-General requirements

(ii) collate surface water and groundwater monitoring data that will inform the development of the regional water balance model referred to in Recommendation 7

(iii) have regard to relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin

(iv) based on data provided, impact assessment reports prepared by proponents, and the use of the model results referred to in Recommendation 7, adopt a risk-based assessment of regional cumulative impacts, including impacts on existing water users, potential habitat loss and impacts on ecological systems. Regional cumulative impacts should include the impacts of proposed mining projects, including but not limited to:

(A) open-cut and underground mining operations

(B) mine dewatering

(C) mine waste management

(D) stream diversions and flood levees

(E) subsidence

(v) report on the success of the Galilee Basin coal mine and coal seam gas proponents' water management measures to inform the ongoing adaptive management of water resources in the region

(vi) periodically publish data and reports with reference to monitoring and assessment program outcomes

[64] Defined as the outcrop area on the eastern edge of the Galilee Basin, extending a distance to the west.

DNRM is designated as the agency responsible for this recommendation.

Part B. Transport

Recommendation 10. Road impact assessment and road-use management plan

(a) To identify and deal with transport impacts on the safety, efficiency and condition of state-controlled roads and local roads, the proponent must prepare and implement, in consultation with the DTMR Central Queensland and Mackay/Whitsunday Regional Offices and Barcaldine Regional Council:

(b) a road impact assessment (RIA), undertaken in accordance with the DTMR *Guidelines for Assessment of Road Impacts of Development (2006)* that incorporates the latest project-related traffic generation projections and an assessment of the impact of project-related traffic on:

  (i) the intersection of the Clermont-Alpha Road and the Clermont Connection Road

  (ii) the performance of the intersection of the Capricorn Highway and the Gregory Highway (North), the intersection of the Capricorn Highway and the Gregory Highway (South), and the intersection of the Capricorn Highway and Alpha-Clermont Road

  (iii) the ability of the Clermont-Alpha Road to sustain increased light vehicle traffic and any associated safety issues for road users from Clermont to the site.

  The proponent should submit the RIA for approval by DTMR no later than six (6) months prior to the commencement of significant project-generated traffic.

(c) a road-use management plan (RUMP), developed in accordance with DTMR's *Guide to Preparing a Road-use Management Plan,* for the use of all state-controlled and local roads for each phase of the project which includes:

  (i) latest traffic generation data and a finalised assessment of impacts on safety and efficiency at intersections, on road links and on pavements

  (ii) impact mitigation strategies, in particular details of how the proponent intends to ensure preferred routes are used by all traffic and how the proportion of FIFO and BIBO trips are to be achieved and maintained over the life of the project.

  The proponent should submit the RUMP for approval by DTMR no later than six (6) months prior to the commencement of significant construction relating to project mining activities.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 11. Infrastructure Agreement with DTMR

(a) The proponent should enter into an Infrastructure Agreement with DTMR about:

  (i) upgrading of affected intersections as determined and agreed upon with the DTMR Mackay/Whitsunday Regional Office and DTMR Central Queensland Region (Barcaldine Office)

  (ii) access to/from state-controlled roads, including project accommodation facilities and material stockpile locations

  (iii) maintenance contributions to mitigate road or pavement impacts associated with project traffic as determined by the updated RIA and calculated and agreed upon with DTMR Mackay/Whitsunday Regional Office and the Central Queensland Region (Barcaldine Office).

(b) Any infrastructure agreement between the proponent and DTMR should be concluded prior to commencement of any significant construction relating to project mining activities.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 12. Permits, approvals and traffic management plans

To ensure the proponent receives required permits and approvals prior to the commencement of significant project-related traffic the proponent should, no later than three (3) months prior to the commencement of any significant construction relating to project mining activities, or such other period agreed with DTMR:

(a) provide detailed drawings for any works required to mitigate the impacts of project-related traffic to DTMR for review, and obtain DTMR approval

(b) obtain the relevant licences and permits under the *Transport Infrastructure Act 1994* for works within the state-controlled road corridor

(c) consult with DTMR's Heavy Vehicles Road Operation Program Office, the Queensland Police Service and relevant local councils with regard to any excess mass or over-dimensional loads associated with the project. As required under the *Transport Operations (Road Use Management) Act (Qld) 1995*, permits must be obtained prior to undertaking each of these movements during the construction and operational phases of the project.

(d) prepare a Heavy Vehicle Haulage Management Plan for any excess mass or over-dimensional loads for the construction and operational phases of the project in consultation with DTMR's Heavy Vehicles Road Operation Program Office, the Queensland Police Service and relevant local councils. Permits that are required under the *Transport Operations (Road Use Management) Act (Qld) 1995,* must be obtained prior to undertaking movements during all phases of the project.

(e) prepare Traffic Management Plan/s (TMP) developed in accordance with DTMR's *Guide to preparing a Traffic Management Plan*, to be implemented during the construction and commissioning of any required roadworks including site access points, road intersections or other works undertaken in the state-controlled road corridor.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 13. Rail coal dust management

(a) A Coal Dust Environmental Management Plan that is similar to and broadly consistent with the QR Network (2010) Coal Dust Management Plans must be prepared. The management plan must specify how impacts of fugitive coal dust on rail infrastructure, ecological values and any nuisance sensitive place will be prevented.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 14. Addressing cumulative impacts on the road network

To fully assess and mitigate the cumulative impacts of major projects on the state-controlled and local road networks in the Southern Galilee Basin region the proponent should actively engage with DTMR, BRC and other Southern Galilee Basin mining proponents to:

(a) participate in a cumulative impact assessment to determine the impacts of all project-generated traffic on the road network and contribute funding as agreed with DTMR towards the assessment

(b) assess the feasibility of funding a strategic road upgrade program in lieu of ongoing maintenance and rehabilitation contributions

(c) efficiently deliver a road network that will support the construction and operation of the proposed mines.

DTMR is designated as the agency responsible for this recommendation.

Recommendation 15. Transport infrastructure agreement with Barcaldine Regional Council

(a) Prior to the commencement of any significant construction relating to project mining activities works, the proponent and BRC should execute a transport infrastructure agreement to address the construction, upgrade and maintenance of transport infrastructure to support the construction and operation of the project. Matters to be considered in the development of this agreement include but are not limited to:

    (i) maintenance and upgrades of local roads, including Degulla Road and Jericho-Degulla Road

    (ii) upgrades to the Alpha Aerodrome.

Barcaldine Regional Council is designated as the agency responsible for this recommendation.

Appendix 5. Response to IESC advice

Introduction

Queensland is a signatory to the Council of Australian Governments (COAG) National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development (NPA). The NPA requires coal seam gas or large coal mining development proposals undergoing environmental impact assessment that are likely to have a significant impact on water resources to be referred to the Independent Expert Scientific Committee (IESC).

On 20 December 2012, I submitted to the IESC a joint request for advice (with the Australian Government Department for Sustainability, Environment, Water, Population and Communities (SEWPaC)) for the Kevin's Corner project. The IESC provided final Kevin's Corner project advice to my office and to SEWPaC on 7 February 2013.

The IESC advice informed my evaluation of the Kevin's Corner project and is discussed in relevant sections of this Coordinator-General's evaluation report. Following is a consolidated response to the IESC advice.

IESC advice and Coordinator-General's response

IESC comment 1

In terms of cumulative impacts within the Galilee Basin, the Committee notes that the Interim Independent Expert Scientific Committee considered the Alpha Coal Project in 2012 and that a suite of further projects is proposed for the region. It is anticipated that the developments in the Galilee Basin are going to be large in scale, with tributaries to the Burdekin Catchment dissected by mines along a coal strike of approximately 300 km. The Kevin's Corner proposal may significantly contribute to cumulative impacts associated with mining proposals along this strike, noting that the project will be one of the largest coal mines in Australia, mining approximately 30 million tonnes of coal per year for over 30 years. Further, more than three billion tons of overburden and interburden will be generated from the open-cut pits. As such, the Committee considers that information relating to the potential impacts of this project should be commensurate with its scale.

I consider that the requirements of the *State Development and Public Works Organisation Act 1971* have been satisfactorily fulfilled, and that sufficient information has been provided in the EIS documents to enable the evaluation of project impacts.

I acknowledge the IESC's advice regarding potential cumulative impacts and have made recommendations to relevant state government departments for the collation of monitoring data, the risk-based assessment of cumulative impacts on water resources in the eastern edge of the Galilee Basin, and an ongoing adaptive management regulatory framework. This includes the establishment of a regional groundwater and surface water monitoring and assessment program (refer to the response to IESC comment 3 below).

IESC comment 2

Given the pending development scenarios for the region, the Committee has been advised by the Office of Water Science that the Galilee Basin has been identified as a priority sub-region for completion of a bioregional assessment. The Committee recommends that the bioregional assessment should include an assessment of groundwater impacts associated with the Galilee Basin (which may affect the Great Artesian Basin to the west), and surface water impacts associated with the Burdekin Catchment (which may be impacted to the east).

I acknowledge the Australian Government's proposed bioregional assessment for the Lake Eyre Basin, of which the Galilee Basin has been identified as a priority sub-region, but note the assessment will not be complete within the timeframes of decision-making required for many of the coal mining projects proposed in the Galilee Basin.

My response to IESC comment 3 outlines recommendations I have made to relevant state government departments for the development of a numerical regional water balance model, local water quality objectives and the risk-based assessment of cumulative impacts on water resources in the eastern edge of the Galilee Basin (Appendix 4, Recommendations Recommendation 7, Recommendation 8 and Recommendation 9). I have recommended that this work has regard to the relevant key deliverables expected from the bioregional assessment.

IESC comment 3

The Committee suggests that a regional and site water balance should be provided as baseline information and a risk-based approach should be developed to examine local and regional impacts. The cumulative impact assessment should also include an assessment of habitat loss and impacts to ecological systems.

Based on advice received from state agencies, I am satisfied that the proponent has provided adequate information on the likely site water balance, project water requirements and the assessment of potential impacts of the project on water resources (in particular, as provided within SEIS Appendices I, M, K, L, S, O and Q). In evaluating this assessment documentation, I have stated draft Environmental Authority conditions to minimise risks to water resources including, but not limited to, comprehensive site water management, water balance requirements and void hydrology long-term water balance requirements (Appendix 1, Schedule C).

While I consider that the requirements of the SDPWO Act have been met for this individual project, I acknowledge the IESC's recommendation for regional water balance modelling and cumulative impact assessment. This could further enhance individual project assessments. I consider this to be the responsibility of the Queensland Government Departments of Natural Resources and Mines (DNRM) and Environment and Heritage Protection (DEHP) as lead agencies for the ongoing management of water resources. Accordingly, I have made several recommendations for these state government agencies to ensure the monitoring and assessment of regional water resources, including recommendations for the development of a regional water balance model (RWBM), local water quality objectives and a regional water monitoring and assessment program.

Regional Water Balance Model

DNRM has undertaken a preliminary regional scale assessment of the water balance of the eastern edge of the Galilee Basin. This assessment by groundwater specialists within DNRM considered all inputs, outputs and exchanges of water within the Basin. Hydrologic impacts from proposed coal mining projects in the Galilee Basin, as provided through various EIS documents, were reviewed and utilised as reference material in the preliminary assessment. This information provided some understanding of the risk to adjoining water entitlement holders and impact on the groundwater resources. DNRM advises that the preliminary assessment has also identified ways to enhance the reliability of regional groundwater models.

DNRM proposes to subject the draft technical report on the preliminary regional groundwater assessment to external review. The primary limitation of the current preliminary groundwater assessment is considered to be constraints to validating assumptions, linked to the paucity of historical groundwater data for aquifers in the Basin. However, DNRM considers that estimates of mine impacts could be further enhanced as more data becomes available through the operational stages of the mines. This data would progressively improve the basis for more comprehensive numerical modelling which would, in turn, enable more robust assessment of impacts on specific water resources and environmental assets.

I consider that the development of a RWBM would complement work completed to date by DNRM and contribute to the ongoing adaptive management of water resources in the region. Accordingly, I have recommended that DNRM develop and maintain a RWBM (Appendix 4, Recommendation 7) which should:

- identify linkages between hydrogeological formations, the likely extent of aquifer connectivity and groundwater/surface water interactions, and characteristics of aquifer recharge
- use baseline monitoring and site water balance model data provided by project proponents
- have regard to relevant key deliverables expected from the Australian Government's proposed Bioregional Assessment for the Lake Eyre Basin
- determine potential impacts on groundwater resources and surface water flow conditions, environmental values and existing surface water users.

Regional water monitoring and assessment program

To more fully address cumulative impacts on water resources, I recommend the development of a regional groundwater and surface water monitoring and assessment program (Appendix 4, Recommendation 9) that will utilise the results of the baseline RWBM (Appendix 4, Recommendation 7). The program, to be developed and maintained by DNRM in consultation with DEHP and Galilee Basin mine proponents, will:

- establish a protocol with mine proponents for the collation and delivery of surface water and groundwater monitoring data
- collate and overview surface water and groundwater monitoring data recorded by project proponents in accordance with project approval requirements
- have regard to relevant key deliverables expected from the Australian Government's proposed bioregional assessment for the Lake Eyre Basin

- based on data provided and impact assessment reports prepared by project proponents, adopt a risk-based assessment of regional cumulative impacts, including potential impacts on existing water users, aquatic habitat loss and impacts on ecological systems. Regional cumulative impacts include the impacts of proposed mining project activities, including but not limited to:
  - open-cut and underground mining operations
  - mine dewatering
  - mine waste management
  - stream diversions and flood levees
  - subsidence
- report on the success of water management measures and to inform the ongoing adaptive management of water resources in the region
- periodically publish data and reports with reference to monitoring and assessment program outcomes.

I have also imposed conditions to ensure the proponent contributes to the regional groundwater and surface water monitoring and assessment program when it is established, including pro-rata funding (Appendix 3.Condition 2 and Condition 3).

Water quality objectives

To address potential cumulative impacts on water quality, I recommend the development of Belyando-Suttor sub-catchment environmental values and water quality objectives pursuant to the provisions of the Environmental Protection (Water) Policy 2009 (Appendix 4, Recommendation 8). Water quality objective development will have regard to the baseline monitoring and site water balance model data provided by project proponents, relevant key deliverables expected from the Australian Government's proposed bioregional assessment for the Lake Eyre Basin, the results of the baseline RWBM and the ongoing regional surface water and groundwater monitoring and assessment program.

DEHP advises that work is already underway to address Recommendation 8.

IESC comment 4

In terms of the integrity of the Rewan Formation (the basal confining unit of the hydrological GAB), particularly in relation to its ability to restrict connectivity with the GAB, the IESC advises that the Formation is generally considered to have low porosity and permeability. However, there is evidence to suggest that localised faulting may exist. Thus, while the primary porosity and permeability of the rock matrix is considered to be low, it is plausible that site specific faulting presents a potential for connectivity and vertical groundwater flow. The extent of faulting in the Rewan Formation in the local setting should be determined in order to inform the connectivity assessment. The Committee further notes that there are a range of studies underway, such as the GAB Water Resource Assessment, which will provide for better understanding of the level of complexity and connectivity in such systems.

Localised faulting and Great Artesian Basin connectivity

The EIS shows that the project mine footprint does not extend far enough west to intercept the Clematis Sandstone Great Artesian Basin (GAB) aquifer (located 10 km to the west of

the western mining lease boundary). Potential impacts may only arise from groundwater draining via localised geological fault structures from the Clematis Sandstone through the Rewan Formation into the aquifers of the Bandanna Formation and the Colinlea Sandstone. This would require a reduction in head in the Colinlea Sandstone significant enough to induce the transfer of water from the Clematis Sandstone through the approximately 175-metre-thick Rewan Formation (aquitard).

No major regional scale fold and fault structures have been mapped crossing or connecting any of the geological units within and adjacent to the mining lease application (MLA) area (1:250000 Jericho Geological map, Geological Survey of Queensland (GSQ[65])). Furthermore, exploration drilling logs and seismic geophysical surveys of the MLA area did not indicate significant faulting or displacement of coal seams that could promote inter-aquifer or inter-basin hydraulic connection. Some minor faults were detected across the MLA area (refer to Figure 4-6, SEIS Appendix L). The minor faults are located east of the most easterly outcrop of the Rewan Formation and are consequently not connected to the Rewan. In this area, Tertiary sediments are underlain by either the Bandanna Formation or the Colinlea Sandstone and not by the Rewan. Figure 1 illustrates the minor faults in the context of the mining lease and geological boundaries.

[65] http://mines.industry.qld.gov.au/geoscience/about-gsq.htm

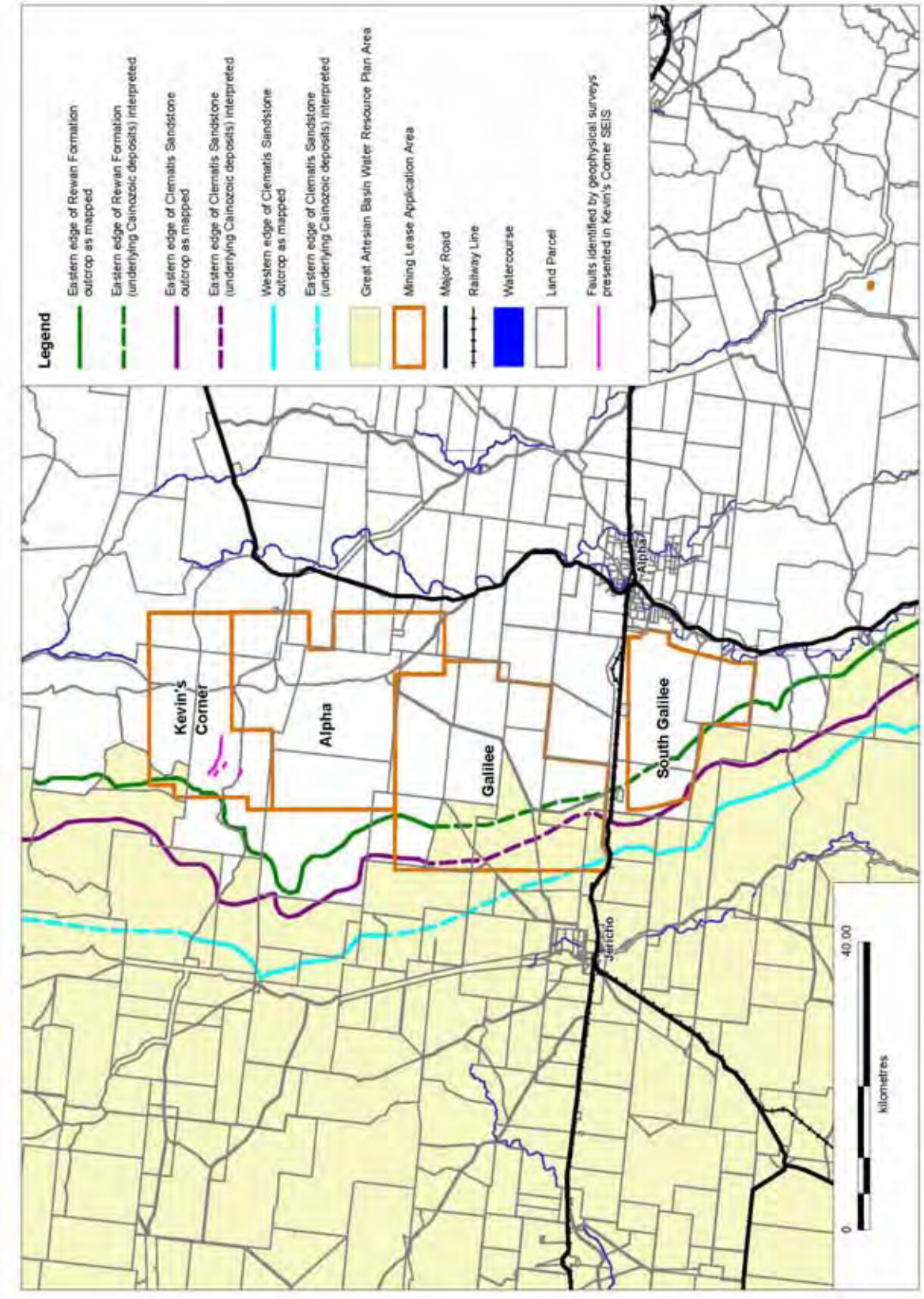


Figure 1: Minor faults (based on seismic data) in relation to mining lease and geological boundaries

Two faults of limited extent are mapped on the Jericho Geological Map to the west of the mining lease boundary. One is located within the Rewan Formation and to the east of the Clematis Sandstone outcrop and the second is predominantly located in the Rewan Formation and potentially protrudes into the edge of the Clematis Sandstone outcrop (where the Clematis Sandstone aquifer is unlikely to exist). However, there is no information provided in GSQ's map explanatory notes as to the nature of these faults.

The first fault contained wholly within the Rewan outcrop and located closest to the mine site is shown as intersecting the Kevin's Corner and cumulative (Alpha Coal and Kevin's Corner) 5-metre drawdown contour with the drawdown contour being for the water contained within the D coal seam.

The second fault referred to above is located outside the 1-metre drawdown contour. DNRM advises that for there to be any possible connection, the faults would need to extend through the Rewan and Bandanna Formations. As the Clematis Sandstone aquifer is not present above the Rewan Formation in the location of the fault within the drawdown contours shown on the map, no connection could be made.

Based on the SEIS groundwater modelling results, which predict that the closest GAB aquifer (Clematis Sandstone) will not be impacted by the Kevin's Corner or Alpha Coal projects, and given there is only a possibility of minor faults, DNRM considers that the project is unlikely to impact the GAB aquifers.

As a precautionary approach, in order to identify any unforseen impacts that may be caused by the mining operations, I have made recommendations regarding the monitoring of groundwater levels in the Rewan Formation and Clematis Sandstone (Appendix 4, Recommendation 2). In particular, the proponent must construct a minimum of three monitoring bores in the Rewan Formation and the Clematis Sandstone, with the Clematis Sandstone bores positioned such that they provide early warning of any potential changes in groundwater levels caused by the proponent's operations.

Refer to the response to IESC comment 11(c) regarding the need for an appropriate drawdown trigger level in the Rewan Formation and Clematis Sandstone.

Great Artesian Basin Water Resource Assessment

The Great Artesian Basin Water Resource Assessment[66] (GABWRA), released on 27 March 2013, provides a reclassification of the GAB hydrostratigraphy by expanding the previously defined 'aquifers' and 'aquitards' into five new graduations ('aquifer', 'partial aquifer', 'leaky aquitards', 'tight aquitards' and 'aquicludes') to provide a better representation in the variability of physical properties associated with geological formations in the GAB.

The GABWRA contains no specific information regarding the Rewan Formation 'aquitard' for the Central Eromanga Region (the relevant region for the Galilee Basin). Notwithstanding this, Figure 3.6 of the report indicates a low potential for hydraulic connection between the basal confining unit of the GAB and the top of underlying basement sequences in the general area between Longreach and the project area. It also indicates negligible potential for hydraulic connection along the eastern margin of the GAB closest to the project area.

[66] Water resource assessment for the Great Artesian Basin. A report to the Australian Government from the CSIRO Great Artesian Basin Water Resource Assessment. **https://publications.csiro.au/rpr/pub?pid=csiro:EP132685** (accessed 8 April 2013)

IESC comment 5

The IESC considers that groundwater quality may be impacted by increased aquifer connectivity associated with subsidence and from uncertainty regarding tailings management. The IESC notes that toxicants (associated with overburden placed into out-of-pit emplacement areas for the first two years of mining) are predicted to remain on site, migrating towards the KC and Alpha final voids. However, a detailed tailings assessment is required to determine potential impacts from the overburden that will be placed in-pit behind the active mining strip.

Increased aquifer connectivity associated with subsidence

Section 8.2.1 of the ISMP (SEIS Appendix N) addresses interflow between aquifers. Cracks created during longwall mining will allow for the direct interconnection between units of differing hydrochemistry. The resultant blending of fresh, brackish, and saline can result in an alteration of groundwater quality. Thus the resultant fracturing could potentially increase interconnection between units and the confining pressures could allow for groundwater movement between units.

Mine dewatering will reduce the impacts of this alteration to hydrochemistry as the composite groundwater would be used on site and would not result in aquifer through-flow from the site. Predictive post-mining model results indicate that groundwater will flow towards the final void at the Alpha Coal Mine and not into regional aquifers or surface water systems. Further, site investigations show groundwater in the units overlying the targeted coal seams occurs as sporadic unconfined perched groundwater, and the units are not regarded as significant regional aquifers.

I have stated draft Environmental Authority conditions (Appendix 1, Schedule C) requiring the comprehensive monitoring of groundwater hydrochemistry for 20 chemical and physical water quality parameters for comparison with contaminant trigger values for underlying aquifers (including Alluvium, Bandanna Formation, Colinlea Sandstone, Rewan Formation and Tertiary). If groundwater quality characteristics exceed any of the stated trigger values, the proponent must complete an investigation into the potential for environmental harm. DEHP advises it will respond to any non-compliance of Environmental Authority conditions or unauthorised environmental harm and has the ability to use a number of enforcement measures in accordance with DEHP's Enforcement Guidelines.[67]

Uncertainty regarding tailings management

The majority of mining waste generated by the project will be overburden/ interburden from the open cut mining operations (approximately 3.15 billion tonnes over the life of mine (LOM)), supplemented by a relatively small quantity of coarse rejects and fine rejects (150 and 70 million tonnes LOM, respectively) from the coal handling and preparation plant (CHPP).

Tailings will be placed into a purpose-built above-ground tailings storage facility for the first five to seven years of mining, followed by in-pit disposal of tailings into the northern pit for the remaining life of the mine. Appendix E of the SEIS presents a geochemical assessment of coal and mining waste materials associated with the Kevin's Corner project. The results of

[67] http://www.ehp.qld.gov.au/management/pdf/enforcement-guidelines.pdf

the geochemical assessment indicate that the bulk overburden/interburden material is Non-Acid Forming (NAF) and has a high factor of safety with respect to potential acid generation.

To protect water resources, I have stated a number of draft Environmental Authority conditions to ensure the effective assessment and management of mining waste (Appendix 1, Schedule F). A detailed mining waste assessment program will be required for the progressive characterisation of all mining waste prior to disposal, including for net acid producing potential, salinity, physical properties and a number of key contaminants (iron, aluminium, copper, magnesium, manganese, calcium, sodium and sulphate).

A Mining Waste Management Plan, to be developed and implemented prior to mining activities commencing, must address and include a CHPP Waste Management Plan, Tailings Management Plan and Mining Waste Emplacement Area Operational Plan. Plans must be reviewed and reported on each calendar year for adaptive management. The mining waste emplacement areas within the open pit must be designed to ensure all seepage from the mining waste (waste rock, spoil, overburden, tailings and course reject material) is appropriately confined and contained prior to decommissioning and rehabilitation (Appendix 1, Condition F14).

IESC comment 6

In terms of impacts to surface water, the IESC considers that the proposed discharge scenarios are inadequate, as scenarios are not discussed for all of the proposed release points. Further, water quantity and quality parameters of proposed medium and high flow discharge scenarios appear to be significantly above, site specific, reference data and have the potential to adversely impact ecological communities.

The Site Water Management (Basis of Design) Report (SEIS Appendix M) details sufficient system capacity such that there would be an extremely low probability of uncontrolled (spillway) discharge to the receiving environment (1:100,000 Annual Exceedence Probability[68] (AEP)). Key design features include directing spillway discharges into internal receiving structures such as the open-cut pits, and providing for significant contingency mine water storage (in the form of mine water dams 3 and 4).

The Department of Science, Information Technology, Innovation and the Arts (DSITIA) has reviewed the proponent's discharge strategy and considers that it will ensure the protection of environmental values of receiving waters in accordance with the Environmental Protection (Water) Policy 2009 and relevant guidelines that provide water quality objectives to protect these values.

I have stated several draft Environmental Authority conditions in order to protect surface water values. To ensure regulated structures (i.e. dams and levees) are designed to accommodate extreme weather events, Appendix 1, Schedule G, specifies the design requirements and hydraulic performance criteria that must be addressed as part of the detailed design and operation of regulated structures.

[68] The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year.

Appendix 1, Schedule C outlines detailed requirements to address surface water discharge during extreme weather events, including flow rates and water quality of both the discharge and receiving waters. A Receiving Environment Monitoring Program must be developed and implemented to monitor, identify and describe any adverse impacts on surface water environmental values, quality and flows due to the mining activity. This will include periodic monitoring of the effects of the mine on the receiving environment (under natural flow conditions) and while any mine-affected water is discharged from the site, should that be required in specified cases.

Based on the comprehensive requirements of the Environmental Authority conditions and advice received from DEHP and DSITIA, I am satisfied that the water management system and discharge strategy is appropriate. Should any surface water discharge be required in specified cases, I am satisfied that discharges made in accordance with the conditions would not result in significant adverse impacts on environmental values.

IESC comment 7

The IESC considers that the proponent's existing discharge strategy is inadequate. The strategy should be revised so that median levels for water quality parameters for stressors should not exceed the relevant 80th percentile values of reference data for the appropriate discharge. The median release water quality for toxicants should be sufficient to protect 95% of species, consistent with ANZECC 2000 guidelines. If water quality parameters are unable to be met, water should be retained on site, such as in proposed dams or temporarily stored in open-cut pits, and treated to levels that allow discharge with no or minimal environmental risks. Baseline monitoring should also be undertaken daily after an event, for a minimum of the first seven days, to help determine water quality parameters of first flush events.

DSITIA considers that the proponent's discharge strategy developed and implemented in accordance with conditions outlined in Appendix 1, Schedule C will ensure the protection of environmental values of receiving waters in accordance with the Environmental Protection (Water) Policy 2009 and relevant guidelines that provide water quality objectives to protect these values. These guidelines include, but are not limited to, the *Queensland Water Quality Guidelines*[69], and the *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*.[70] Refer to Attachment A (page 374) for DSITIA's detailed advice on median levels and percentiles as recommended by the IESC.

Assessment of background data was used by the proponent as a basis for proposed release contaminant trigger levels for metals above the default guideline levels.[71] These levels can only be modified in those cases where the 80th percentile of background site data is significantly different to the default ANZECC trigger. This generally occurs in areas where the natural mineralogy elevates the concentrations of toxicants to comparatively high levels and needs to be demonstrated for each parameter. Both minimum site data and criteria indicated

[69] Department of Environment and Resource Management, *Queensland Water Quality Guidelines*, Department of Environment and Resource Management, Brisbane, 2009, viewed 7 May 2013, http://www.ehp.qld.gov.au/water/guidelines/queensland_water_quality_guidelines_2009.html.

[70] Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian Water Association (Artarmon) and NZ Water and Wastes Association (Auckland), 2000, viewed 7 May 2013, http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html.

[71] ANZECC and ARMCANZ trigger values for Slightly or Moderately Disturbed Systems; or limits of reporting (LOR) where analytical methods are not sufficiently sensitive.

in Section 4 of the *Queensland Water Quality Guidelines* need to be considered in the derivation of local water quality guidelines. Modified trigger values have subsequently been developed using data collected by the proponent in accordance with these methods.

I have stated draft Environmental Authority conditions (Appendix 1, Schedule C) which set receiving environment monitoring and contaminant trigger levels at upstream (background or baseline) and downstream monitoring locations. If quality characteristics of the receiving water at the downstream monitoring points exceed any specified trigger level during a release event, the proponent must compare the downstream results to upstream results in the receiving waters and where exceedences are identified, investigate the potential for environmental harm, including actions taken to prevent environmental harm.

Appropriate monitoring timeframes have been included in the draft EA conditions referred to above. Two forms of monitoring are required: compliance monitoring and the Receiving Environment Monitoring Program (REMP). Monitoring frequencies related to discharge and compliance monitoring have been defined including daily monitoring for discharges, trigger investigation levels and receiving waters contaminant trigger levels.

IESC comment 8

The IESC notes that the KC and Alpha projects involve a number of creek diversions and levees which have the potential to impact water quality and local hydrology. Specifically:

a. the Alpha Project will divert creeks towards the KC tenement. Due to the close proximity of the creeks to the KC mine, the IESC considers that there may be ingress of surface water to completed longwall panels; and

b. in sections where stream power is increasing, the KC creek diversion has the potential to increase erosion in some areas (especially in areas affected by subsidence), which may reduce channel capacity and increase floodplain inundation and frequency. Changes to hydrology have the potential to alter community composition towards species which can tolerate more frequent inundation.

Hydraulic modelling[72] for the baseline and developed (with mine) scenarios predicted that, despite an increase in flood levels of up to 1.1 m during a 1:1000 AEP event, no significant changes to the area of flooding or duration would occur from the construction and operation of the project (excluding those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure). This is due to the flood levees, which will traverse the left bank of Sandy Creek, and the relatively steep natural topography on the right bank of the channel that spans the area of increased water level.

Areas of prolonged inundation (i.e. surface water ponding) are predicted associated with subsidence from proposed underground mining. Refer to my response to IESC comment 9 regarding subsidence-related impacts of the project.

The Kevin's Corner project and adjacent Alpha Coal project involve a number of creek diversions and flood levees which may result in cumulative flooding impacts. The cumulative impact assessment of both projects (SEIS Appendix S) determined that flood levels within the Kevin's Corner mining lease may increase by up to 90 mm (in addition to the 1.1 m

[72] SEIS Appendix K: Revised Surface Water Hydraulics Report

increase predicted for the Kevin's Corner project) and result in an equivalent afflux at the upstream (Alpha Coal project) lease boundary. However, flood protection for the Kevin's Corner project has been designed with a one-metre freeboard above the 1:1000 AEP flood level (of 1.1 m) which is considered adequate to prevent inundation of the project site (including completed longwall panels) from a 90 mm increase in water levels.

With the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, a comparison of the cumulative flood extent with the modelled baseline scenario shows no significant change in the area of flooding or duration.

The Alpha Coal project is not predicted to cause increased stream flow, velocity or power within the Kevin's Corner MLA beyond that predicted for the Kevin's Corner project for minor events (1:2 and 1:50 AEP). This indicates that there is not likely to be a cumulative impact on erosion and sedimentation rates within the Kevin's Corner MLA.

DNRM advises that at this stage of the approval process the proponent's assessment documentation sufficiently addresses the impact of the Kevin's Corner and Alpha Coal projects on local hydrology and geomorphology. Further information on the detailed design of the watercourse diversions and hydrological impacts will be provided for both projects as part of future applications for licences required under the *Water Act 2000*. In particular, the design of any diversion will need to be to acceptable engineering standards and in accordance with the *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*.[73] This requires that watercourse diversions replicate the geomorphic and riparian vegetation conditions of existing watercourses. These principles are also outlined in the Australian Coal Association Research Program (ACARP) report *Maintenance of Geomorphic Processes in Bowen Basin River Diversions, Stages 1, 2 & 3*.[74]

I have stated a number of draft Environmental Authority conditions in order to protect surface water values. In particular, Appendix 1, Schedule G, specifies the design requirements that must be addressed during the detailed design phase of the project in order to ensure regulated structures (i.e. dams and levees) protect mining areas, including subsided longwall panels and pits, under extreme weather events.

[73] Department of Natural Resources and Mines, *Central West Water Management and Use Regional Guideline: Watercourse Diversions – Central Queensland Mining Industry version 5*, Department of Natural Resources and Mines, 2011
[74] R Hardie & K White, *Maintenance of Geomorphic Processes in Bowen Basin River Diversions, Stages 1, 2 & 3*, Australian Coal Association Research Program Project C9068, ID&A, Earth Technology, 2001.

IESC comment 9

The IESC considers that subsidence also has the potential to alter surface-groundwater connectivity. It is highly probable that fracturing will have surface expression over a significant portion of the proposed mine resulting in increased surface water loss to the groundwater. It is stated by the proponent that clays present in the overburden will swell to stop this leakage; however no supporting evidence has been provided to support this claim. Subsidence and associated mitigation measures are also likely to alter water quantity and quality and vegetation communities towards species which can tolerate more frequent inundation. Further, the Committee notes that there is insufficient evidence to substantiate the effectiveness of proposed mitigation measures at the site.

Localised loss of surface water flow through surface cracking

Refer to my response to IESC comment 5 regarding potential groundwater quality impacts resulting from increased aquifer connectivity associated with subsidence.

The proponent's assessment of the potential for surface cracking is provided in the ISMP (Appendix N of the SEIS), including modelling of tension zones and surface cracks (section 3.2). This modelling is considered a worst-case assessment as it is based on an overburden composed wholly of intact bedrock and does not take into account the Tertiary and Quaternary sediments which overlay much of the project area (clay-rich with an average thickness of 40 m). Crack widths are expected to range from 4–40 mm to 19–190 mm in the Northern Underground Mine area, from 6–60 mm to 14–140 mm in the Central Underground Mine area, and from 7–70 mm to 16–160 mm in the Southern Underground Mine area.

Surface cracking may provide a conduit for channel flow to percolate into the cracks and voids with a resulting loss of stream flow. Section 9.3 of the ISMP notes that percolation would need to be very rapid in order to significantly reduce the flood flows responsible for geomorphic change in the channel. Additionally the Tertiary and Quaternary age alluvium that underlies the surface is not likely to suffer the same extent of cracking as would be the case for intact bedrock. As a consequence, the ISMP considers that the potential cracking effects on flood flows are not likely to have geomorphic significance.

The ISMP identifies a number of measures to mitigate the impacts of subsidence-related surface cracking. To prevent ongoing seepage, surface cracks will be either grouted or ripped and seeded where cracks do not silt up within three storm water events. Ripping will result in a disturbance footprint which is equal to the width of the dozer used to undertake the ripping. Grouting will involve the placement of the grout material into the cracks. This may comprise a bentonite-based grout or a cement-based grout, or the placement of crushed rock into deeper cracks.

I have stated a number of draft Environmental Authority conditions (Appendix 1, Schedule F) to ensure the proper and effective management of subsidence impacts of the 30-year life of the mine. Prior to the commencement of activities that result in subsidence, a final Subsidence Management Plan must be implemented detailing mitigation measures and a program for monitoring and adaptive management. The effectiveness of the plan must be reviewed and reported on annually, including recommended actions to ensure actual and potential impacts are effectively managed for the coming year.

Ponding within subsided areas

The ISMP predicts that over the 30-year life of the mine, subsidence will result in a total of 109 ponds of varying area, depth and lifespan forming above the northern and southern sections of the underground mine areas as well as Well Creek, Middle Creek, Rocky Creek and Little Sandy Creek. These ponds will occur sequentially as underground mine operations move from east to west. In accordance with the ISMP, mitigation measures will be undertaken to reduce the extent of ponding and ensure that significant ponded areas (areas where ponding may occur for greater than six months) are drained following the completion of each longwall panel. Ponds will be drained by excavating the area above the downstream pillar to allow drainage into natural drainage lines on completion of each longwall panel. Surface water outside of these depressions will run naturally through drainage lines into the creek systems.

Nonetheless, there is still the potential for inundation of some areas of native vegetation, even with mitigation measures in place. Whilst riparian vegetation may establish in ponded areas, non-riparian vegetation may be adversely impacted by periods of ponding as they are not as adapted to waterlogging. As a precautionary measure, the proponent is proposing to offset all predicted subsidence impacts, including predicted pond areas.

Offsetting predicted subsidence impacts

In accordance with the Kevin's Corner Biodiversity Offset Plan, the proponent will offset all high-value potential habitat for MNES and state-significant biodiversity values that are predicted to be impacted by subsidence, including ponding, cracking and associated mitigation works (refer to Figure 3.2 of the Kevin's Corner Biodiversity Offset Plan). Accordingly, the project will have offsets in place significantly in advance of the predicted impacts, given some of the underground mine areas will not be developed for 20–30 years.

I consider that, in addition to offsetting upfront predicted subsidence impacts, an adaptive approach to assessing and mitigating impacts from subsidence is required. The proponent has proposed a comprehensive monitoring program of subsidence and an assessment of the success of mitigation measures be implemented over the 30-year period of underground mining. As outlined in the proponent's ISMP, the proponent would document actual impacts and validate predicted subsidence-related impacts from the modelling in five year stages. Monitoring results would be reported at the end of each five-year period with any proposed changes to management measures.

I have stated a condition (Appendix 1, Schedule F) requiring the Kevin's Corner Biodiversity Offset Plan to be reviewed by May of every fifth year from the grant of the environmental authority and a report prepared which:

- assesses the area of biodiversity values predicted to be impacted by the mining activities for the next five years
- identifies the actual areas of biodiversity values impacted by the mining activities.

Based on the results of monitoring, where the actual area of disturbance is identified as greater than the modelled area of disturbance, I have conditioned (as part of the draft Environmental Authority) that supplementary biodiversity offsets must be provided (Appendix 1, Schedule F).

IESC comment 10

The IESC also considers that changes to hydrology may impact vegetation community composition at the site. For example, inundation regimes may adversely impact MNES (e.g. Black Throated Finch and Red Goshawk) in the area. Due to the reduction in catchment area from the Alpha and KC proposals, the proponent's assessment concludes that areas inundated for more than 96 hours will be reduced. The IESC considers that further information is required to determine potential impacts from the proposal, such as site species tolerances to inundation regimes and implications for MNES.

As noted in my response to IESC comment 8, with the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure, hydraulic modelling for the baseline and developed (with mine) scenarios predicted that despite an increase in flood levels of up to 1.1 m during a 1:1000 AEP event, no significant changes to the area of flooding or duration would occur from the construction and operation of the project. This is due to the flood levees, which will traverse the left bank of Sandy Creek, and the relatively steep natural topography on the right bank of the channel that spans the area of increased water level.

Similarly, the cumulative flood extent predicted for the Kevin's Corner and Alpha Coal projects (SEIS Appendix S) identified no significant change in the area of flooding or duration with the modelled baseline scenario (with the exception of those areas to be cleared in order to construct the open-cut mine pits, tailings storage facility and associated infrastructure).

The increase and changes in inundation areas as a result of subsidence (ponding) and decreases associated with the construction of regulated structures (in order to protect open-cut mine pits and other project infrastructure) have been included in the MNES assessment (SEIS Appendix Q) and the offset calculations (Kevin's Corner Biodiversity Offset Plan).

My response to IESC comment 9 provides further information regarding subsidence-related impacts on hydrology, including ponding.

IESC comment 11(a)

The IESC notes that the proponent proposes a number of conditions as part of the Environmental Management Plan, italicised below, and suggests the following points:

a. *Proposed condition W15: 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:*

   i. *release commencement date/time;*

   ii. *expected release cessation date/time;*

   iii. *release point/s;*

   iv. *release volume (estimated);*

   v. *receiving water/s including the natural flow rate; and*

   vi. *details (including available data) regarding likely impacts on the receiving water/s.*

To assist in determining potential impacts, the IESC suggests the addition of information relating to: expected release timings and durations; released water quality; water quality upstream and downstream of release sites; and the total estimated salt loads and heavy metal concentrations of the discharge event.

The additional information suggested by the IESC has been included in the draft Environmental Authority conditions I have stated in this report (Appendix 1, Schedule C, Condition C17).

IESC comment 11(b)

b. *Proposed condition W22: If quality characteristics of the receiving water at the downstream monitoring points exceed any of the specified trigger levels during a release event, the Environmental Authority holder must compare the downstream results to the upstream results in the receiving waters and:*

   i. *where the downstream result is the same or a lower value than the upstream value for the quality characteristic then no action is to be taken; or*

   ii. *where the downstream results exceed the upstream results, complete an investigation in accordance with the ANZECC and ARMCANZ 2000 methodology, into the potential for environmental harm and provide a written report to the administering authority in the next annual return outlining:*

   iii. *details of the investigation carried out; and*

   iv. *actions to prevent environmental harm.*

The Committee suggests for Condition W22 (and where relevant for W15) that disposal of pit water should be underpinned by best environmental practice and take into consideration the frequency of extreme weather conditions/events.

The additional information suggested by the IESC has been included in the draft Environmental Authority conditions I have stated in this report (Appendix 1, Schedule C, conditions C8–19). These conditions provide for monitoring and management of release events of mine-affected water if and when required. DEHP advises that best practice

environmental management underpins the design and operation of the project as well as the development of the draft Environmental Authority conditions.

IESC comment 11(c)

c. *Proposed condition W60: The holder of the environmental authority must monitor and record water levels within the Rewan Formation as the basal aquitard unit of the Great Artesian Basin ... Where groundwater drawdown fluctuations of five metres or more below the minimum levels recorded within the Rewan Formation during background monitoring ... are recorded, not resulting from pumping of licensed bores, the holder of this environmental authority must undertake an assessment of the potential for induced flow from the Great Artesian Basin aquifers. The holder must notify the administrating authority of the outcomes of this assessment within 14 days following completion of this assessment.*

The Committee notes that the proposed five metre drawdown trigger conforms with the Queensland Baseline Assessment Guideline (2011) definition of long term affected areas. However, as information on observed water levels and fluctuations does not appear to have been provided, the Committee is unable to determine whether a five metre drawdown trigger in the Rewan Formation is adequate for early detection of induced flow from Great Artesian Basin aquifers. The Committee suggests that consideration be given to an independent assessment to determine an appropriate drawdown trigger level for the Rewan Formation. The assessment should be in addition to proposed monitoring of the Clematis Sandstone and the development of a cumulative impacts model for the Galilee Basin.

In addition to monitoring requirements of the Rewan Formation and Clematis Sandstone and the development of a cumulative impacts model for the Galilee Basin, based on advice from DNRM, I have recommended (Appendix 4, Recommendation 3) that the proponent provide an assessment of:

- the baseline level (natural groundwater level) in each bore constructed within the Clematis and Rewan Formations (based on at least 12 months of baseline monitoring data)
- appropriate trigger levels (lower and upper levels).

In the event drawdown resulting from the project operations did occur (allowing for seasonally adjusted levels), the proponent must provide to DNRM an independent assessment of potential altered groundwater flow conditions in the Rewan Formation or Clematis Sandstone, including consideration of the implications of this take on the requirements of the *Water Resource (Great Artesian Basin) Plan 2006* and any potentially impacted licensees.

Attachment A: DSITIA advice regarding water quality discharge parameter levels

The Qld Department of Science, Information Technology, Innovation and the Arts (DSITIA) provides the following detailed advice in response to IESC Comment 7 regarding water quality discharge parameters:

> **IESC Comment 7**
>
> 'The IESC considers that the proponent's existing discharge strategy is inadequate. The strategy should be revised so that median levels for water quality parameters for stressors should not exceed the relevant 80th percentile values of reference data for the appropriate discharge. The median release water quality for toxicants should be sufficient to protect 95% of species, consistent with ANZECC 2000 guidelines …'

The above quote is not consistent with the protocols used for compliance assessment of environmental monitoring data against guidelines/reference sites (refer Table D.1 of the Queensland Water Quality Guidelines) and perhaps confuses the process used to derive appropriate release limits for an activity.

For assessment of environmental physico-chemical data, the median concentration of collected environmental data (test data set) should not exceed the water quality objective. The water quality objective for a particular stressor is established by; as per scheduled in the Environmental Protection (Water) Policy 2009, derived by taking the 80th percentile value from site-specific reference sites data, or applied from specific guidelines for relevant environmental values (e.g. Aquatic ecosystems). However, assessment protocols for toxicants (as defined in ANZECC and ARMCANZ (2000)) specify that the 95th percentile of the test data set (rather than the median) should not exceed the water quality objective. This water quality objective is often based on the level of protection assigned to the local aquatic ecosystem. For example, for slightly to moderately disturbed ecosystems are typically assigned a 95 % of species protection level (see Volume 1, Table 3.4.1 (ANZECC and ARMCANZ 2000)).

In a release situation, it is anticipated that you are dealing with mine-affected water rather than environmental water samples, hence the water quality data collected end of pipe should not be assessed using the "median against water quality objectives" as this is designed to assess water quality in the environment (and would be a highly conservative approach to apply end of pipe). Consideration of achievable best practice in terms of water quality treatment and the dilution factor and mixing with receiving waters are crucial for the design of end of pipe limits. Also, it is well established that water quality concentrations can be highly variable and for an end of pipe limit to be set on a percentile basis (median or 95th percentile) would require a statistically reliable number of samples to be collected and analysed for each release event. Many parameters conditioned in environmental authorities require laboratory analysis and it is unrealistic to expect continuous high frequency measurement of these in order to obtain such statistics from a compliance perspective for either the operator or the regulator. Percentile based end of pipe limits are typically reserved for certain stressors where a continuous discharge is planned. Typically, a realistic minimum monitoring frequency is defined in the conditions, and a realistic maximum (rather than median or 95th percentile) release limit is established based on either Model Conditions for the activity or site specific assessment of baseline monitoring data and achievable best practice**.** Every measurement of the parameter at this prescribed monitoring frequency at end of pipe, the

value should be less than the maximum release limit/trigger specified in conditions in order for this site to have a compliant release**.**

The process of setting release limits/triggers varies depending on the specific parameter (stressor) of relevance to the activity. Because default guidelines (e.g., ANZECC and ARMCANZ trigger values for toxicants) do not consider what is naturally present within an ecosystem, release limits or trigger values can be based on the 80th percentile of reference site data. Applying default guidelines as release investigation trigger levels when reference site data indicates levels in the environment are naturally higher is not consistent with the intention of the ANZECC and ARMCANZ (2000) guidelines. Please refer to Section 7.4.4.2 page 7.4-8 in this case:

> "Some surface waters will contain concentrations of toxicants that may naturally exceed the default guideline trigger values tabulated in Section 3.4. Where this is the case and as recommended in Section 3.4.3.2, new trigger values should be based on background (or baseline) data."

However, these default guidelines are only rejected as triggers for application in environmental authority conditions where there has been sufficient data collected from suitable background reference sites as defined in Section 4 of the Queensland Water Quality Guidelines, and following review by the administering authority and/or water quality scientists.

In specific cases, for parameters such as electrical conductivity (EC) and sulphate, it is generally required that the maximum release limits end-of-pipe must be equal to or better than the water quality objectives under low or no flow conditions. For example, the water quality objective for EC, is in fact the 75th percentile of reference site data (not the 80th percentile). Please refer to Appendix G of the Queensland Water Quality Guidelines for further explanation. Higher EC mine affected water should only be released under medium to high flow scenarios in receiving waters (to ensure sufficient dilution and mixing).

Appendix 6. Social impact assessment

Schedule 1. Impact assessment

During the SIA, potential impacts arising from the project were given an initial ranking from low to very high based on their likelihood and magnitude in accordance with the framework in Table 1.

Table 1 Significance of impacts

Likelihood	Magnitude				
	Insignificant	Minor	Moderate	Major	Severe
Rare	Low	Low	Medium	High	Very High
Unlikely	Low	Low	Medium	High	Very High
Possible	Low	Low	Medium	High	Very High
Likely	Low	Medium	High	Very High	Very High
Almost Certain	Low	Medium	High	Very High	Very High

Positive and negative impacts were then grouped into Valued Social Components (VSC) for further analysis to assist in the development of actions and strategies to enhance, avoid, mitigate or manage impacts. The VSC were:

- history and settlement
- demographic
- culture and community dynamics
- housing and accommodation
- health, wellbeing and social infrastructure
- education and training opportunities
- labour market and employment opportunities
- industry and business
- income and cost of living
- governance
- primary industry and access.

Further analysis of the impacts was then undertaken to reflect the proponent's mitigation and management actions, and to consolidate the impact categories. Table 2 demonstrates the relationship between the revised impact categories and the impacts identified in the SIA.

Table 2 Consolidation of impact categories

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
Access to community services and social infrastructure	Medium	Health, Wellbeing and Social Infrastructure	Increased local community and health services	Pos	LoP	Moderate	Possible	Medium
			Improved service capacity at the Alpha Hospital to service the local population and potentially the project–immediate response	Pos	LoP	Minor	Likely	Medium
			Potential for more volunteers to be available for sport and recreation activities, increasing the availability of such activities	Pos	LoP	Minor	Likely	Medium
		Governance	Increase in funds through rates, donations and taxes	Pos	LoP	Moderate	Likely	High
			Delivery of services achieved – social, health and emergency services	Pos	LoP	Moderate	Possible	Medium
			Delivery of health and emergency services not achieved	Neg	LoP	Major	Possible	High
			Development of effective links to local government programs	Pos	LoP	Moderate	Possible	Medium
		Education and Training	Increase in school places due to population increase – elementary & secondary	Pos	LoP	Moderate	Possible	Medium
Impaired road safety environment	High	Health, Wellbeing and Social Infrastructure	Increased potential for accidents because of more traffic or driver fatigue	Neg	LoP	Major	Likely	High

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
		Industry and Business	Increased traffic – large haul trucks/road trains	Neg	Con	Major	Almost Certain	Very High
		Primary Infrastructure and Access	Increased road use – associated safety issues and maintenance - Capricorn Highway	Neg	Feas	Moderate	Almost Certain	High
					Con	Major	Almost Certain	Very High
					Oper	Moderate	Almost Certain	High
			Increased road use and associated safety and maintenance issues – Alpha-Clermont Road	Neg	LoP	Moderate	Likely	High
			Increased access - Alpha–Clermont Road	Pos	LoP	Minor	Almost Certain	Medium
Heightened anxiety regarding the future direction of the region/communities	Medium	History and Settlement	Profile changing from agriculture to include mining	Neg	Feas	Moderate	Possible	Medium
				Pos	LoP	Moderate	Possible	Medium
			People move to Alpha from other parts of BRC	Neg	Con, Oper	Moderate	Possible	Medium
				Pos				
			Larger distance between properties or reduced access may breakdown family/social relations	Neg	Beyond	Moderate	Likely	High
		Culture and Community Dynamics	Lifestyle changes as a result of increased wages	Neg	LoP	Moderate	Possible	Medium
				Pos	LoP	Moderate	Unlikely	Medium
			New arrivals upset balance of power in the community	Neg	LoP	Moderate	Possible	Medium

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
		Health, Wellbeing and Social Infrastructure	Negotiation and uncertainty stresses	Neg	Feas	Moderate	Unlikely	Medium
			Increased community concern and anxiety because of potential for increased crime and violence with miners	Neg	Con, Oper	Moderate	Possible	Medium
		Income and Cost of Living	Increases in volume of high mining wages	Pos	LoP	Moderate	Likely	High
			Increase in the cost of living (including housing costs) (regional)	Neg	LoP	Moderate	Possible	Medium
			Increase in the cost of living (particularly housing costs) (local)	Neg	LoP	Moderate	Possible	Medium
Interference with Indigenous Cultural Heritage	Medium	N/A (refer Cultural Heritage Management Plan – see Volume 2 Section 18 of the EIS)	N/A	Neg				
Housing availability and affordability	Low	Demographics	Population increase in Alpha of more than 5%	Neg	LoP	Serious	Possible	Very High
			Population increases by less than 5% in Alpha	Neg	LoP	Minor	Likely	Medium
			Population Increase	Pos	LoP	Moderate	Possible	Medium
		Housing and Accommodation	Increased costs of housing and rental	Neg	Con, Oper	Major	Almost Certain	Very High
Residents' safety and sense of security	Low	Health, Wellbeing and Social Infrastructure	Increased community concern and anxiety because of potential for increased crime and violence with miners	Neg	Con, Oper	Moderate	Possible	Medium

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
		Primary Infrastructure and Access	Potential for spills, releases, fires or explosions causing safety hazards to communities	Neg	LoP	Major	Rare	High
Local, Regional and Indigenous Employment and Training Opportunity (incorporating the outcomes of the ILUA and the CHMP)	Low	Culture and Community Dynamics	Local capacity increased	Pos	LoP/ Beyond	Moderate	Almost Certain	High
		Health, Wellbeing and Social Infrastructure	Increased skills in the community to respond to emergencies	Pos	LoP	Moderate	Possible	Medium
		Education and Training	Potential for community to share in mine-specific training	Pos	LoP	Minor	Likely	Medium
		Labour Market and Employment	Change in occupation	Neg	Beyond	Minor	Likely	Medium
			Increased employment opportunities	Pos	LoP	Moderate	Almost Certain	High
			New people to area bring skills for other (non-mining) industries	Pos	LoP	Moderate	Almost Certain	High
		Health, Wellbeing and Social Infrastructure	Increased wages as a result of employment on Project	Neg	LoP	Moderate	Possible	Medium
				Pos	LoP	Moderate	Likely	High
		Income and Cost of Living	Increase in wages – mining wages	Pos	LoP	Moderate	Likely	High
		Governance	Potential increase in candidates/staff due to population increases and new skills	Pos	LoP	Minor	Likely	Medium
Increased sales for existing local and regional businesses and increase in the number of businesses based locally	Low	Industry and Business	Increased support, service and supplier opportunities	Pos	LoP	Moderate	Possible	Medium
			Business opportunities – service and materials	Pos	LoP	Moderate	Likely	High
			Increased competition (loss of staff)	Neg	LoP	Moderate	Possible	Medium

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
		Income and Cost of Living	Increased services and businesses in the region	Pos	LoP	Moderate	Likely	High
		History and Settlement	Increased long-term stability to Clermont, Emerald and region	Pos	LoP	Minor	Likely	Medium
Local / regional infrastructure enhancement	Medium	Governance	Successful engagement with local and regional planning processes	Pos	LoP	Moderate	Possible	Medium
			Development of effective links to local government programs	Pos	LoP	Moderate	Possible	Medium
		Primary Infrastructure and Access	Increased road use and associated safety and maintenance issues – Alpha–Clermont Road	Neg	Feas	Moderate	Almost Certain	Medium
					Con	Major	Almost Certain	Very High
					Oper	Moderate	Almost Certain	High
			Improved telecommunications	Pos	LoP	Moderate	Possible	Medium
N/A	N/A	Health, Wellbeing and Social Infrastructure	Increased potential for accidents because of more traffic or driver fatigue	Neg	LoP	Major	Likely	High
		Industry and Business	Increased traffic – large haul trucks/road trains	Neg	Con	Major	Almost Certain	Very High
		Primary Infrastructure and Access	Increased road use – associated safety issues and maintenance - Capricorn Highway	Neg	Feas	Moderate	Almost Certain	High
					Con	Major	Almost Certain	Very High
					Oper	Moderate	Almost	High

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
							Certain	
			Increased access - Alpha–Clermont Road	Pos	LoP	Minor	Almost Certain	Medium
The Community Support Fund will support community based projects aimed at increasing community capacity within the region. The Community Support Fund will be managed jointly with the BRC and is available to contribute to social infrastructure according to priorities set by the community through the BRC. Likely priorities are: • Social, Health and Wellbeing; • Education and Training • Environment; and • Economic Development		Governance	Failure to effectively engage with regional planning process	Neg	LoP	Moderate	Possible	Medium
			Failure to effectively engage with local planning process	Neg	LoP	Moderate	Possible	Medium
			Development of effective links to Local Government programs	Pos	LoP	Moderate	Possible	Medium
		Health, Wellbeing and Social Infrastructure	Increased demand on Alpha Hospital	Neg	LoP	Major	Almost Certain	Very High
			Increased demand on emergency services in Alpha – police	Neg	LoP	Moderate	Almost Certain	High
			Increased demand on local community services and facilities	Neg	LoP	Moderate	Likely	High
			Increased use of social infrastructure requiring maintenance	Neg	LoP	Minor	Likely	Medium
			Potential for more volunteers to be available for sport and recreation activities, increase availability of such activities	Pos	LoP	Minor	Likely	Medium
			Increase in funds for social infrastructure	Pos	LoP	Moderate	Unlikely	Medium
			Improved availability and choice of sporting and recreational activities	Pos	LoP	Minor	Likely	Medium
		Demographics	Population increase in Alpha of	Neg	LoP	Serious	Possible	Very High

Revised impacts	Revised impact	SIA Valued Social Components	SIA impacts	SIA Pos/Neg	Duration	Significance	Likelihood	SIA Level of Impact
			more than 5%					
		Education and Training	Increased demand for child care	Neg	LoP	Major	Likely	Very High
		Culture and Community Dynamics	Lifestyle changes as a result of increased wages	Neg	LoP	Moderate	Possible	Medium
				Pos	LoP	Moderate	Unlikely	Medium
		Labour Market and Employment	Skills drain from other industries	Neg	LoP	Major	Possible	High
			Decrease in labourers available to assist on property	Neg	LoP	Moderate	Unlikely	Medium
			Perception of workers leaving one sector for mine employment	Neg	LoP	Moderate	Likely	High
			Increased competition within industry (many employment opportunities)	Pos	LoP	Moderate	Likely	High
		Industry and Business	Deterrence of the tourism industry	Neg	LoP	Moderate	Possible	Medium
		Primary Infrastructure and Access	Improved telecommunications	Pos	LoP	Moderate	Possible	Medium

Schedule 2. Impact mitigation actions and strategies

Housing and accommodation

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Construct a site-based mining accommodation village with capacity to accommodate 100% of the project workforce including contract and permanent employees.	• On-site workers accommodation village constructed ahead of Project demand; and • Workforce resident in the on-site workers accommodation village whilst on roster.	HGPL EPC Manager	Preconstruction Pre Full Production
Consult with stakeholders regarding workers accommodation village location, design, size and facilities (incl. medical) management approach.	• BRC and State Government support the accommodation village design, size and location; and • Workforce supports the village design and facilities.	HGPL BRC DHPW EPC Manager	Preconstruction and Ongoing
Construct workers accommodation village compliant with current building standards with sufficient social and recreational opportunities and support services to minimise impacts on Alpha services, community safety and social values.	• Compliance with workers accommodation village approvals and conditions of approval; and • On-site social, recreation and support services provided to the satisfaction of Project workforce.	HGPL/EPC Manager	Preconstruction and Ongoing
Prepare accommodation village for flooding and any event that would cause the accommodation village to be isolated, including the need for sufficient supplies to be brought in for these emergencies.	• Emergency Management and Response Plan developed and implemented.	HGPL BRC QFRS QAS QPS EPC Manager DoC	Preconstruction
Monitor the project impacts on housing availability and affordability in Alpha and the BRC area. Monitoring timeframes and triggers need to consider the time taken to release land for development; and the planning frameworks (e.g. may need to consider 5 year look ahead).	• Quantitative measures to be agreed.	HGPL BRC State agencies (including Queensland Trade and Treasury, OESR and Valuer General)	Ongoing
At the time of recruitment, identify the housing intentions of new Project workforce members (contractors and permanent). Work with BRC and DSDIP to communicate and deliver preferred housing options where possible, in particular, for those Project workforce members wishing to reside in Alpha in the future.	• Workforce engagement which includes attitudes towards accommodation; and • Consultation with BRC and DSDIP.	HGPL BRC DSDIP	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Explore options for delivering housing in Alpha if feedback from workers is that they intend to reside in Alpha.	• Timely release of serviced land and housing in Alpha for Project workforce; and • Number of Project workers resident in Alpha.	HGPL BRC DSDIP	Ongoing
Monitor the impact on BRC rental stocks as a result of the project and cooperate with the BRC, DHPW, other Project proponents and housing providers to develop strategies that offset negative impacts. This will include monitoring of social housing and where necessary, liaison with DHPW and DoC.	• Residential vacancy rate in Alpha and BRC; • Median land prices for housing in Alpha and BRC do not increase more than standard CPI (or equivalent measures); and • Number of vacant serviced lots of residential land in Alpha and Barcaldine Regional communities.	HGPL BRC DHPW DoC	Ongoing
Housing and retail/commercial property availability and affordability to be a standing item at the Galilee Basin CSIA Roundtable and KCCC/Galilee Basin SCCC.	• Quantitative measures to be agreed.	KCCC/Galilee Basin SCCC Galilee Basin CSIA Roundtable BRC HGPL	Ongoing
Consult with BRC and State Government agencies to understand the existing situation and future planning (short, medium and long term) with regard to housing and accommodation (including rentals); and process for planning for future provision.	• Quantitative measures to be agreed.	HGPL BRC DHPW	Preconstruction
Monitor impacts on affordability and availability of retail and commercial properties as a result of the project.	• Quantitative measures to be agreed.	HGPL BRC OESR	Preconstruction and Ongoing
Contribute to housing market research that identifies vulnerable housing market segments and vulnerable locations in the sub-region and in other parts of Queensland including workforce source communities. Establish a baseline, targets and triggers and strategies to support housing market monitoring and impact mitigation.	• Evidence based housing market monitoring program.	HGPL BRC IRC CHRC DHPW State Government	Preconstruction and Ongoing
Cooperate with State Government, Councils and relevant housing stakeholders and other proponents to develop joint strategies to monitor housing demand generated by resource development in the Galilee Basin and deliver offsets that mitigate unacceptable housing market impacts.	• Evidence of joint strategies in response to Project generated housing demand; and • Joint strategies that support Alpha development planning and housing provision.	HGPL BRC DHPW	Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Work collaboratively with government in regional planning forums addressing housing affordability and availability and encourage other industry stakeholders to cooperate with outcomes from these forums. Report on cumulative housing affordability and availability issues at the KCCC/Galilee Basin SCCC and the Galilee Basin CSIA Roundtable and other forums, as directed.	• Participation of the project's senior representatives in planning forums for housing availability and affordability; and • Evidence of the project participation in regional planning forums (Galilee Basin CSIA Roundtable).	HGPL Councils DSDIP DHPW	

Workforce Management

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Implement HGPL Good Neighbour Policy, Workforce Code of Conduct and an Emergency Management and Response Plan (EMRP).	• Reported incidents of antisocial behaviour by Project workforce in Alpha; • Number of Code of Conduct breaches; and • Health, Safety, Environment, Community and Heritage (HSECH) advisory bulletins delivered to residents.	HGPL BRC EPC Manager	At Induction Preconstruction and Ongoing
Advise the labour market of intentions to operate and recruit on FIFO, DIDO or BIBO basis and the locations of the points of hire.	• Liaison with key stakeholder regarding Workforce Management Plan.	HGPL Skills Queensland	Preconstruction
Implementation of Local Employment Policy (LEP) that: • Includes a hierarchy of preferred employment (i) local area (ii) regional area (iii) rest of Queensland (iv) rest of Australia (v) overseas (if and when required); • Gives preference to local people and investigates the development of Pre-Employment Training Programs; and • Notifies local people of employment opportunities, through local newspapers and media, including Indigenous media.	• Local Employment Policy developed and successfully implemented; and • Quantitative measures to be agreed.	HGPL Energy Skills Queensland Department of Employment, Education and Training (DETE) Mining Industry Skills Centre (MISC) Local Councils Local training providers	Preconstruction and Ongoing
Liaise with DEEWR-funded FIFO Coordinators to source workers from areas around Queensland with high unemployment and areas with employment capacity.	• Numbers of workers recruited through DEEWR-funded FIFO Coordinators; and • Number of workers recruited from high unemployment areas.	HGPL Skills Queensland	Preconstruction
Participate in preparation of Central Queensland Workforce Development Strategy by providing workforce estimates and workforce profiles to relevant stakeholders in timely manner to assist with planning and program development and/or identifying short and long term employment gaps.	• Key stakeholders have a list of job positions and skill requirements in a timely manner to enable appropriate planning responses.	HGPL Energy Skills Queensland CQU, TAFE, DETE QMEA, DSDIP Registered training providers	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Work closely with DETE to assist with the delivery of workforce development strategies that link with existing local and regional, training programs and up-skilling.	• Employment and Training Strategy developed and agreed between DETE and HGPL.	HGPL DETE	Preconstruction and Ongoing
Project recruitment will allow equal opportunity for all, and facilitate active inclusion of disadvantaged groups, e.g. Indigenous people, women, mature workers and disabled people, specifically via: • Anti-discrimination and cultural awareness training during induction; • Strategies to increase number and % of local area residents and under represented groups participating in skills development training; • Strategies to increase number of Indigenous employees; and • Number and % of staff trained, including number of apprentices, from the local area. Investigate opportunities for providing inclusion and awareness programs for disadvantaged groups and for the greater workforce to facilitate a cooperative and supportive working environment, These might include: • forums or groups for disadvantaged workers such as an employee consultative network to communicate with management and program coordinators • education and health and wellbeing awareness and training for managers and others involved in recruitment and employment • Mentoring program for disadvantaged groups with opportunities for networking and development	• Recruitment policy developed and successfully implemented; and • Anti-discrimination and cultural awareness training is included within induction and 100% of staff are inducted.	HGPL BRC Indigenous groups DETE DSDIP	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Work with Skills Queensland to identify skills gaps in the local community and to tap into opportunities, e.g. programs available for skilling workers to fill these gaps (ongoing assessment).	• A suite of training programs have been documented to be delivered by government; and • Relevant training partnership agreements with government.	Skills Qld TAFE CQU RAPAD BRC DSDIP DATSIMA Not-for-profit organisations/training providers	Preconstruction
Consider local needs in recruitment of key Project positions. Investigate opportunities to backfill jobs through training, where critical employment gaps are created by the project. Investigate clauses in HGPL employment contracts that specify a start date after a replacement to fill existing position of employment in local town.	• HGPL contract clauses developed as part of recruitment policy.	Skills Queensland BRC	Preconstruction
Investigate the development of a locally based community access to training program.	• Number and % of local area residents and underrepresented groups participating in skills development training; and • Number and % of staff trained, including number of apprentices, from the local area.	HGPL Skills Queensland DEEDI TAFE RAPAD BRC Agricultural Colleges - Emerald and Longreach Not for profit organisations/training providers	Preconstruction and Ongoing
Investigate the opportunity to establish a combined proponent training association that provides a range of programs targeting core skills and competencies required for the project.	• Quantitative measures to be developed.	HGPL Other proponents Queensland Resources Council	Preconstruction and Ongoing
Engage with DETE, TAFE, CQU, and relevant registered training providers to develop a suite of training programs for delivery and/or private training providers.	• Evidence of communication of workforce requirements to DSDIP and DETE; and • Number of BRC and other students given work experience and/or receiving scholarships or financial support.	Emerald TAFE CQU Registered Training Providers DETE	Preconstruction

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Develop a multi-skilled workforce that promotes and supports individual career path progression. HGPL will investigate a range of staff development programs, including a Professional Development program and career path progression to support workforce retention.	• HGPL labour force retention rates.	BRC DEEDI Skills Queensland	Preconstruction and Ongoing
Implement a community based local trainee and apprenticeship program in the BRC area (once operations commence) targeted to both the industry requirements as well as wider community needs. In particular, HGPL will develop a: Graduate Program; Traineeship Program; Indigenous training programs; and Apprenticeship programs.	• Number of Project-funded apprentices and trainees employed by local businesses; • Number and % of local area residents and underrepresented groups participating in skills development training; and • Number of and type of training programs delivered across Project - by provider and trainee.	BRC, local schools, DETE RAPAD BRC Not-for-profit organisations/training providers	Preconstruction
To address long-term supply of electro-technology workers, investigate the applicability of the Apprenticeship Incubator Program to the project currently being developed by Energy Skills Queensland.	• Opportunities investigated with Energy Skills Queensland.	Energy Skills Queensland	
Establish key contacts at key schools in BRC, IRC and CHRC. Schools to conduct presentations about vocational opportunities to encourage applications for workforce opportunities.	• Established contact at key schools; (including schools where local students maybe boarding)and • Annual presentation is given to BRC, IRC and CHRC schools.	Emerald High School, Clermont School Alpha School	Preconstruction and Ongoing
Investigate the establishment of a scholarship program to provide opportunities to local students and facilitate access to employment opportunities at the mine.	• Scholarships promoted and awarded annually; • Number or % of scholarships recipients which end up gainfully employed, either at the mine or elsewhere; and • Quantitative measures to be developed.	Local schools – Emerald, Alpha, Clermont, Barcaldine	Preconstruction and Ongoing
Work with QMEA and QRC to expand their existing programs into the local area and in regional areas of high unemployment, as a means to encourage young people to start careers in the resource sector.	• Number of school to industry pathway programs provided to local schools in local area.	QMEA QRC Local schools Schools in areas of high unemployment	Preconstruction and ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
HGPL will work with the Australian and Queensland Governments, QRC to implement their Memorandum of Understanding (MOU), as applicable to Project. HGPL will work with key stakeholders to investigate the expansion of the Bowen Basin Indigenous Participation Partnership (BBIPP) to Galilee Basin.	• Indigenous Participation Partnership established for Galilee Basin.	Bowen Basin Indigenous Participation Partnership (BBIPP) DATSIMA Local Indigenous groups DEEWR	Preconstruction and ongoing
Appoint a dedicated Indigenous Liaison Officer position to provide employment information and business development and contracting opportunities to Indigenous people, and assist with: Establishing an Indigenous Liaison Committee (ILC); and Developing Indigenous Participation initiatives that identify direct employment opportunities offered by the project, retention strategies and capacity building strategies locally and regionally for indigenous participation.	• Attendance and participation at Negotiation Table meetings; • Recruitment and retention of Indigenous Liaison Officer; • Regular meetings of ILC and feed into Galilee Basin CSIA Roundtable.	DATSIMA Local indigenous groups/Organisations DEEWR Job Services Australia	Preconstruction
Identify potential barriers to indigenous participation and work with key stakeholders to develop appropriate strategies to support increased indigenous workforce participation.	• Indigenous workforce participation; • Evidence of supporting key stakeholder to develop programs to support increased indigenous workforce participation.	DATSIMA Skills Queensland	Preconstruction and ongoing
Regularly monitor the Pit Crew Report to review the labour market and the need (if at all) for skilled migration For critical labour force shortages for identified skilled position, determine if targeted skilled migration will be required Provide settlement support to attract and retain migrants	• EMA developed in a timely manner if required. • Liaison with relevant government agencies about linking to existing migrant support programs.	HGPL DSDIP	Preconstruction
Report on cumulative workforce management issues at the KCCC/Galilee Basin SCCC and the Galilee Basin CSIA Roundtable.	• Attendance at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; • Number of issues raised at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; and • Number of issues resolved at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable.	HGPL KCCC/Galilee Basin SCCC Galilee Basin CSIA Roundtable Local Community Council representatives from FIFO source communities Other mining proponents Queensland Treasury	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Implement Fit for Work - Fatigue Management Procedure. Investigate the use of a mechanism to monitor vehicle movements (planned versus actual) to enable better/more appropriate fatigue management. Development of the plan should also include relevant engagement and education of employees and stakeholder. Investigate the provision of a bus service from Alpha to site for employees residing in Alpha.	• Fatigue Management Policy developed; and • Low number of near miss reports and traffic incidents on public roads.	HGPL QPS Local Community	Preconstruction and Ongoing
Develop and implement a work roster to: • Allow QFRS Alpha auxiliary personnel and emergency service volunteers to attend training and other duties i.e. volunteers employed by the mine would be placed on a staggered roster; and • Minimise the impacts on family functioning and travel time for employees.	• Roster implemented that meets the needs of HGPL and employees.	HGPL QFRS DSDIP Mining Families	Construction and Operation
Adopt employee agreements for local staff that where possible: • Encourage employee volunteering arrangements to be maintained. For example, ensuring that emergency service volunteers are paid during emergency response call outs where such call outs occur during work time.	• Employee agreement which considers volunteer commitments adopted.	HGPL QFRS DSDIP	Construction and Operation
Enforce Fit for Work - Drug and Alcohol Procedure. Enforcement should include random drug and alcohol testing of employees, contractors and consultants to enable zero tolerance to be upheld.	• Drug and Alcohol Policy developed; • Relevant education undertaken with 100% of employees and contractors; • Random drug and alcohol testing undertaken; and • Limited negative feedback received from workers/local community regarding drug/alcohol use and behaviour.	HGPL Local Community	Preconstruction and Ongoing
Implement Workforce Code of Conduct to maximise positive social behaviour for employees, contractors and consultants on-site and in the local community.	• Code of Conduct developed; • Relevant education undertaken with 100% of employees and contractors; and • Limited negative feedback received from workers/local community regarding behaviour.	HGPL Local Community	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Incorporate the following into employee and contractor agreements: • Fit for Work - Drug and Alcohol Procedure; • Workforce Code of Conduct; • Good Neighbour Policy; and • Fit for Work Fatigue Management Procedure.	• Policies and planning included in employee and contractor agreements.	HGPL Local Community	Construction and Operation
Establish mining family support groups in towns identified as supplying FIFO workforce.	• Mining family support groups established where appropriate; • Participation in mining family support groups; and • Value derived from groups (measured via survey).	HGPL Mining Families DoC	Construction and Operation
Implement an education program for workers and contractors incorporating: • Socially acceptable behaviour; • Cultural awareness; • Dealing with changed family functioning and relationships; • Protecting the locals' way-of-life; • Fit for Work - Drug and Alcohol; • Fit for Work- Fatigue Management; • Workforce Code of Conduct; • Good Neighbour Policy; • Health and Wellbeing; • Domestic violence (this may be delivered by Police Domestic Violence Officers); and • Disciplinary measures for infringement of polices and codes of conduct. This program may be delivered through inductions identified in the Workforce Management Plan.	• Education program developed; • Program delivered to 100% of workers and contractors; • Understanding of key components by workers (measured via survey); and • Number of negative reports and code breaches received from workers and local community regarding behaviour.	HGPL Mining Families Local Community	Preconstruction and Ongoing
Promote a healthy living environment through the inclusion of recreational facilities such as a pool, gym, tennis court on-site.	• Mining site planning and development includes facilities such as pool, gym, tennis court.	HGPL Mining families	Construction and Operation
Provide good communication services at the mine site, including phone and internet access to assist workers in maintaining contact with family and friends.	• Communication services provided; and • Minimal disruption to communication services (e.g. loss of service).	HGPL Mining Families Communication service providers	Construction and Operation

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Develop and promote involvement in a social and recreational program (calendar of events) for workers on- and off-site.	• Social Program developed and implemented; • Awareness of social program among employees (measured via survey); and • Participation in social program.	HGPL BRC Local Community	Construction and Operation
Support workforce health via: • Investigating the feasibility of recruiting dedicated on-site medical personnel (potentially including GP, paramedic, physiotherapist); • Establishment of an Employee Assistance Program (EAP) to assist employees dealing with personal issues and cope with family changes; and • Provision of health and fitness support, facilities and recreational opportunities.	• Dedicated medical services recruited; • EAP established; • Awareness of medical services, EAP among employees (measured via survey); and • Establishment of health and fitness services and facilities.	HGPL BRC Central West HHS (QH) Mining Families Local Community QAS	Preconstruction

Health and community wellbeing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Review and update vehicle numbers as needed to inform development of Road Use Management Plan (RUMP) and Traffic Management Plan (TMP) through the life of the project.	• Revised vehicle numbers used in RUMP and TMP.	HGPL DTMR	Preconstruction and Ongoing
Consult DTMR and key stakeholders on the development and implementation of RUMP including consideration of road conditions; education and engagement of employees and stakeholders; and links to the Fit for Work- Fatigue Management Procedure.	• Consultation on RUMP undertaken; and • Road use managed as planned (i.e. limited variation to RUMP).	HGPL DTMR QPS QFRS QAS QH BRC	Preconstruction and Ongoing
Consult with key stakeholders on the development and implementation of a TMP including on-road traffic control and prior advice (advertising etc.) to minimise the impact of road disruptions for the local community; and education and engagement of employees and stakeholders.	• Consultation on TMP undertaken; • Community awareness of upcoming traffic disruptions; and • Number of near miss reports and traffic incidents on public roads.	HGPL DTMR QPS QFRS QAS BRC Central West HHS (QH) Local Community	Preconstruction and Ongoing
Implement an Emergency Management and Response Plan, in consultation with emergency services to ensure shared knowledge of key aspects including evacuation routes, emergency transfer plans, first-aid facilities/supplies. Development of the plan will also include education of employees and stakeholders and where possible capturing the flow-on effects to other social service providers.	• Emergency Management and Response Plan developed.	HGPL QAS QFRS QPS DoC	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Develop and implement a Memoranda of Understanding (MoU) with key service providers to define protocols for accessing assistance from mine-based resources and infrastructure. MOU to address: • Access to the Kevin's Corner airport as an evacuation route in the event of an incident in the region, and the landing of helicopters and fixed wing Royal Flying Doctor Service planes; • Compatibility set up and access to the project communications system, and incident management systems; • Mutual assistance in the event of an incident on-or off-site; • Provision of site maps to assist in on-site emergencies including evacuation maps with arranged meeting points; • Provision of a list of equipment retained on-site to facilitate use if required and ensure on-site equipment is compatible with that of other service providers. Equipment installed on-site will match Australian Standards; • Regular inductions of current emergency services personnel; • Cross-training exercises between the emergency service providers and the project response and rescue team including multi-casualty incident training; • Interface between emergency services and potential medical service contractors on-site (including services and supplies offered on-site); • Use of site meeting room(s) during on-site visits, work arrangements and emergencies; and • Ongoing consultation between emergency services agencies and HGPL.	• MoU in place and reflected in management plans and standard procedures; and • Relevant agencies are engaged as needed and provided with relevant and up to date information (e.g. maps/lists etc.).	HGPL QPS QFRS QAS RFDS Rural Fire Brigade Central West and Central Queensland HHS (QH) DoCS	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Support resource planning for emergency services via provision of information (e.g. employee numbers, work program) to ensure agency resourcing meets the needs of the local community and mine site. This information is to be kept updated as the project changes, and provided to emergency services regularly.	• Key agencies have required information (e.g. employee numbers, work program); • Updated information provided on an annual basis; and • Agency resourcing meets the needs of the local community and mine site.	HGPL QPS Central West and Central Queensland HHS (QH) QFRS QAS DoC BRC OESR	Preconstruction
Collate a contact list of relevant local and regional emergency service agencies and personnel to facilitate delivery of this Action Plan. Investigate the establishment of a web-based, interactive system to support this database.	• Contact list developed and distributed; and • Contact list kept up-to-date.	HGPL QPS QFRS QAS RFDS Rural Fire Brigade Central West and Central Queensland HHS (QH)	Preconstruction and Ongoing
Recruit a dedicated Response and Rescue Team to be based on-site due to the nature of mining (underground, confined space).	• Response and rescue team recruited.	HGPL QFRS QPS QAS DEEDI	Construction and Operation
Investigate opportunities to support health of Alpha and broader region via provision of mutual assistance through GP services to the community through an 'open clinic' arrangement.	• Open clinic arrangement investigated and established.	HGPL BRC Central West HHS (QH) Local Community	
Report on cumulative safety and wellbeing issues at the KCCC/Galilee Basin SCCC and the Galilee Basin CSIA Roundtable.	• Attendance at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; • Number of issues raised at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; and • Number of issues resolved at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable.	HGPL KCCC/Galilee Basin SCCC Galilee Basin CSIA Roundtable Local Community Other mining proponents	Preconstruction and Ongoing
Consult with the regional arms of Queensland Health to better understand the capabilities and needs of local and regional medical centres/hospitals.	• Ongoing consultation undertaken through life of the project.	HGPL Central West and Central Queensland HHS (QH) QAS	Preconstruction and Ongoing

Community and stakeholder engagement

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Develop a framework to guide development of community services and social infrastructure in partnership with BRC to be supported through ongoing annual contributions from the Community Support Fund.	• Projects approved under the Community Support Fund for developing the capacity of community services or enhancing social infrastructure; and • BRC residents satisfied with their community and lifestyle.	BRC HGPL Local community Community groups/organisations	Ongoing
Participate in the development of Galilee Basin Social Infrastructure Plan	• Priority social infrastructure needs in Galilee Basin identified.	HGPL Other proponents Local Councils GB CSIA Roundtable	
Establish a process for the KCCC/Galilee Basin SCCC and local community to provide guidance for funding allocations (i.e. determine circumstances for in full or 2 for 1 ratio donations) from the Community Support Fund. This will be based on key community needs and an assessment of effectiveness of community projects through the life of the project.	• KCCC/Galilee Basin SCCC consulted on process that is established to guide the Community Support Fund allocations.	KCCC/Galilee Basin SCCC HGPL BRC	Ongoing
Develop and implement a Good Neighbour Policy to guide positive interactions between the HGPL staff, contractors and consultants, and the local community, particularly neighbouring landholders.	• Good Neighbour Policy developed; Relevant education undertaken with 100% of employees and contractors; • Number of infringement actions taken; and • Number of negative feedback received from workers/local community regarding behaviour.	HGPL Local Community Landholders	Preconstruction and Ongoing
Implement a Landholder Management Plan to ensure HGPL engages appropriately with affected landholders to monitor impacts on agricultural productivity.	• Landholder Management Plan developed; • Landholder meetings undertaken on regular basis (appropriate timeframe to be confirmed with landholder); and • Number of issues resolved in consultation with landholders.	HGPL Landholders	Construction and Operation
Host 'get to know you' functions for the community to meet the project team and staff members.	• Functions held with good turn out by community.	HGPL Local Community	Construction and Ongoing

Local business and industry content

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Develop a Local Industry Participation Plan (LIPP) based on QRC Code of Practice for Local Content and Industry Capability Network (ICN) website portal for suppliers to register their expression of interest to work with the project and receive regular updates about procurement and tendering opportunities and Project standards.	• Develop and Implement LIPP; and • ICN portal established and utilised (i.e. number of hits).	HGPL DSDIP ICN	Preconstruction and Ongoing
Inclusion of HGPL LIPP contractual requirements in sub-contractor contracts documentation, including having LIPP conditions in Contracts and Procurement Procedures.	• Contractor documentation aligns with LIPP.	HGPL Contractors	Ongoing
Engage and register with the Industry Capability Network (ICN).	• Evidence of communication of contract opportunities to ICN.	HGPL ICN DSDIP Regional Services	Preconstruction and Ongoing
Communicate and promote Project procurement requirements through the project's website and communications materials, as well as local industry communication channels to ensure local businesses are aware of tender opportunities. Website to include links to DSDIP's service range, including that of the Office of Advanced Manufacturing (OAM).	• Number of regional businesses pre-qualified to supply HGPL; and • Evidence of utilisation of website by local and regional businesses.	DEEDI ICN OAM DSDIP Regional Services	Preconstruction and Ongoing
Implement a 'buy local' program to support the sustainability of local and regional businesses. HGPL LIPP to require sub-contractors to do the same.	• Contracts let to - local area, Central Queensland, Rest of QLD, Rest of Australia, Overseas (Construction and Operations).	HGPL HGPL Contractors BRC Local business DSDIP Regional Services	Preconstruction and Ongoing
Establish a Local Supplier Register, including identifying indigenous businesses.	• Existence and use of the Local Supplier Register; Number of regional businesses pre-qualified to supply HGPL, and • Use of Black Business Finder to source opportunities for indigenous businesses.	BRC Local businesses ICN DSDIP Regional Services	Preconstruction

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Investigate flexible service arrangements with local service providers to enable service providers, where possible, to still support local/regional area.	• Number of Flexible Service Agreements negotiated with local service providers.	BRC DSDIP Regional Services HGPL	Preconstruction and Ongoing
Partner with key stakeholders such as local government, DSDIP and ICN to introduce a Regional Capacity Building Program to facilitate training on generic tender and contract requirements (e.g. insurances, standards, quality, and documentation).	• Number of workshops held for local suppliers; • Attendance rates of local suppliers at workshops; and • Number of procurement and tendering workshops in regional centres (Barcaldine, Emerald, Clermont, and Alpha).	BRC IRC CHRC ICN DSDIP	Preconstruction and Ongoing
Partner with key stakeholders to deliver a regional capacity building program including general business management seminars and to up-skill local and regional businesses in key areas such as business start-up, financial planning, resource management, OH&S, environmental management, capability, financial stability and quality.	• Number of workshops held for business development; and • Attendance rates of local and regional businesses at business development workshops.	BRC DSDIP Business community RAPAD Not-for-profit organisations	Preconstruction and Ongoing
As part of Regional Capacity Building Program investigate the opportunity to host an 'Open Day'/Mining Expo in the sub-region to engage with local community/ future employees and businesses/suppliers about the project and what various agencies are able to offer to build local skills and capacity.	• Opportunity investigated.	HGPL DATSIMA DSDIP Indigenous community BRC RAPAD Not-for-profit organisations	Preconstruction
As part of Regional Capacity Building Program engage with DATSIMA and DSDIP to undertake 'readiness programs' with identified Indigenous businesses.	• Number of 'readiness programs' conducted with Indigenous businesses.	HGPL DATSIMA DSDIP Indigenous community BRC RAPAD Not-for-profit organisations	Preconstruction and Ongoing

Actions	Key performance measures	Key stakeholders and potential partner agencies	Timeframe
Report on cumulative local and regional business development issues at the KCCC/Galilee Basin SCCC and the Galilee Basin CSIA Roundtable.	• Attendance at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; • Number of issues raised at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable; and • Number of issues resolved at KCCC/Galilee Basin SCCC and Galilee Basin CSIA Roundtable.	HGPL KCCC/Galilee Basin SCCC Galilee Basin CSIA Roundtable Local Community Other mining proponents	Preconstruction and Ongoing

Appendix 7. Proponent Commitments, May 2013

Updated Proponent Commitment Register

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C.1. Introduction

As a requirement of the Kevin's Corner Project Terms of Reference (TOR), a list of all commitments made by Hancock Galilee Pty Ltd (HGPL) was provided in Volume 2, Appendix G of the Environmental Impact Statement (EIS). Further commitments, largely from responses to submissions through the EIS process, were then published in Volume 2, Appendix C of the Supplementary EIS (SEIS). As a result of the SEIS, the list of Proponent commitments now contains updated and additional post-SEIS commitments, as well as the removal of commitments that have been superseded or made obsolete by its completion since earlier iterations of this Updated Proponent Commitments Register.

This Updated Proponent Commitment Register includes commitments made in the responses to submissions on the SEIS.

Five plans were required to be updated and provided to the Office of the Coordinator General (OCG) in response to submissions on the Kevin's Corner SEIS. HGPL commits to implement these plans, which are required for development and operations of the Project.

These plans, listed below, were

1. Biodiversity Offsets Plan (Public Version), May 2013.
2. Rehabilitation Management Plan, May 2013.
3. Environmental Management Plan May 2013.
4. Off-lease Environmental Management Plan, May 2103.
5. Social Impact Management Plan, April 2013.

HGPL will comply with the commitments made in these documents, which are regulated through the draft Environmental Authority (EA) Conditions and the Coordinator General's Report. To avoid duplication, the commitments include in these plans are not included within this Register.

C.2. Project Description

Proponent Commitment
2.1. Where necessary all licences and permits will be obtained as per legislative requirements prior to commencing the applicable works. All construction activities will comply with legislative and industry standards.
2.2. All structures, buildings and infrastructure within Mining Lease Application (MLA) 70425 currently in-use by local landholders will be acquired and then removed as necessary. The Proponent will consult with affected landowners and other third parties to develop an appropriate relocation plan.
2.3. After construction, the contractors will be required to clear all construction waste, equipment and plant as per their Construction Environmental Management Plan (EMP). Disturbed areas that are not proposed to be utilised for project related activities will be rehabilitated.
2.4. The construction and operational workforce will be managed through a fatigue management policy covering fly-in/fly-out (FIFO), drive-in/drive-out (DIDO), and bus-in/bus-out (BIBO) travel methods.
2.5 Works will commence on the required Tier 2 approvals required for progression of the site infrastructure development as well as the identified management plans required for the early phases of the Project construction.
2.6. Private consultation with potentially affected landholders will be undertaken. These negotiations will commence prior to construction/operation and will be confidential between HGPL and each key stakeholder.

C.3. Climate

There are no commitments associated with this section.

C.4. Geology

Proponent Commitment
4.1. The coal handling and storage areas will require attention to detail to prevent spontaneous combustion (Salva, 2010). Management actions will include consideration of wind direction, the use of coal wetting systems, and compaction.
4.2. Should significant fossil specimens be identified within the mine then steps will be taken to secure and protect the fossils. The Queensland Museum will be notified to allow for the identification and correct preservation and removal. Small fossils may be relocated by site geologists.

C.5. Soils, Topography and Land Disturbance

Proponent Commitment
5.1. A detailed Erosion and Sediment Control Plan (ESCP) will be developed prior to the commencement of construction works.
5.2. Effective erosion and sediment control for the Project site will require appropriate activities to be carried out over the life of the Project including: • Construction; • Operations; and • Rehabilitation and Closure.
5.3. Sediment dams will be provided to intercept as much runoff from the overburden placement as practical.
5.4. Regular erosion monitoring of the rehabilitation areas will be required during the vegetation establishment

Proponent Commitment
period, to demonstrate whether the objectives of the rehabilitation strategy are being achieved and whether a sustainable landform has been provided.

C.6. Land Use and Tenure

Proponent Commitment
6.1. Only the minimum land required for the safe operation of the Project is proposed to be cleared. Land to be cleared will be surveyed and marked out prior to clearing and signed off by an appropriate person as defined in the ESCP, to ensure no significant areas are inadvertently disturbed. The disturbed area of the Project will be rehabilitated progressively where possible. Mine rehabilitation will aim to return the land to the pre-mining land suitability's, except for the final void.
6.2. The EMP will be implemented to minimise adverse impacts on amenity values of local residences and prevent land degradation beyond the necessary disturbance to mining areas.
6.3. All Project infrastructure within MLA 70425 will be developed to meet current Australian Standards.
6.4. The Proponent will undertake to manage impacted stock routes to ensure adequate alternatives and new alignments are proposed to protect the values of the network and ensure there is no net loss of connectivity for the network.
6.5. The envisaged impacts resulting from the airport facility will be ameliorated through: • The Airport EMP and plan of operations, to address flight path issues and hours of operations; • Operational procedures of the aircraft themselves, to address noise and visual impacts; and • Ongoing negotiations and consultation with surrounding landholders.
6.6. Mapping of the ecological values of the Cudmore Resources Reserve area will be used to minimise the impacts of sub-surface infrastructure and activities on areas of high habitat value as far as practicable.
6.7. HGPL will be developing a Stock Route Realignment Strategy which will assist in determining the most appropriate realignments for stock routes U291 and U301. The Stock Route Realignment Strategy aims to address community and agency concerns regarding the proposed alternative alignments.
6.8. To ensure the Stock Route Realignment Strategy develops alternative alignments that accord to landholder and agency requirements, the following principles will be employed: • The quality of pasture along the proposed realignment is of no lesser quality than the pasture along the current alignment; • The topography of the proposed realignment is no less suitable than the topography along the current alignment and that stock can be travelled/agisted along the proposed realignment; • Distances between water points and holding yards are of similar distances and suitable for travelling and agisting stock after the proposed realignment; • Cumulative impacts on the Stock Route Network generated by the Alpha and Kevin's Corner Coal Projects and other proposed mining projects are described, assessed and addressed; and • Stakeholder (including land holders, industry bodies and agencies) concerns about the proposed realignments are adequately addressed and resolved.
6.9. HGPL will progress stock route realignment by ongoing liaison with affected landholders and the Barcaldine Regional Council (BRC).
6.10. HGPL will, where practical, allow grazing on its property above underground mining areas.

C.7. Landscape Character

Proponent Commitment
7.1. The overburden stockpiles and tailings storage facilities will be rehabilitated to a combination of grazing and bushland
7.2. Areas of remnant woodland vegetation within the Project area and those which are beyond the primary disturbance area will be retained where possible.
7.3. Proactive management of natural regeneration will be used as a method of providing additional screening of mine infrastructure in a number of locations within the Project area.
7.4. To reduce the potential for visual glint and glare, the colour contrast and reflectivity of materials and finishes will be taken into account when selecting construction materials, with the aim of minimising any potential visual impacts.
7.5. Where possible programs will be arranged so that highly visible work activities to be carried out across surface areas of the mine occur within daylight hours of operation to minimise night time lighting impacts.
7.6. The site Rehabilitation Management Plan which has been developed as part of a mine Environmental Authority (EA) Condition will outline the amount and location of grazing land and bushland.

C.8. Land Contamination

Proponent Commitment
8.1. Protocols will be developed to further assess (and manage as required) areas of potential contamination in accordance with the Guideline for Contaminated Land Professionals (EHP 2012).
8.2. Stockpiles, workshop areas, chemical stores, fuel tanks and waste disposal/storage areas will be located on hardstand, compacted soil or concrete pads. Appropriate management of surface water runoff from these areas will be implemented.
8.3. Relevant Australian Standards (e.g. for the storage and handling of flammable and combustible liquids and dangerous goods) will be complied with, and all liquid chemical and fuel storage areas will include secondary containment (bunding).
8.4. Where possible, hazardous chemicals and materials will be replaced with less harmful alternatives. Material Safety Data Sheets (MSDSs) for chemicals used or brought to the site will be kept in a central register on site and at the area of use and be readily available to workers at all times.
8.5. Spills will be cleaned up as soon as possible. In particular, designated site vehicles and appropriate facilities will be equipped with appropriate spill kits. For significant chemical or fuel spills, the site emergency response plan will be followed and the appropriate authorities notified as soon as possible.
8.6. Detailed records will be kept of any activities or incidents that have the potential to result in land contamination. Records will be kept in an inventory that contains information on storage locations, personnel training, monitoring data, and disposal procedures for appropriate chemicals, fuel and other potential contaminants used on site. Records will be maintained by the Proponent and made available to relevant authorities on request.
8.7. Regular inspections of containers, bund integrity, valves and storage and handling areas will be carried out by suitably qualified personnel.
8.8. All staff will be trained as part of their site induction in appropriate handling, storage and containment practices for chemicals, fuel and other potential contaminants.
8.9. All mine waste and rejects identified as potential acid generating or potentially harmful to the environment will be handled in accordance with the strategies outlined in Volume 1, Section 16 of this EIS. These mitigation measures will include the adequate containment of the tailings material to minimise potential groundwater and surface water impacts, as well as the appropriate management of any potential ARD material to reduce the potential for acidification and resultant groundwater and surface water impacts.

Proponent Commitment
8.10. Prior to land disturbance and during excavation of soils or extraction of groundwater, should visual contamination be noted, the soils and groundwater will be stored appropriately and tested for contamination.

C.9. Terrestrial Ecology

Proponent Commitment
9.1. A trained ecologist or other suitably qualified environmental field supervisor will precede or accompany clearing crews when clearing significant vegetation, in order to ensure disturbance to rare, threatened or other significant fauna is minimised.
9.2. Infrastructure will be designed and located to minimise further impacts to the ecological values of the local area. Areas of native vegetation requiring removal will be clearly delineated to equipment operators and supervisors before any clearance is conducted to ensure disturbance is minimised. The design, location and construction of such infrastructure will be planned to meet the following performance criteria: 1. Vegetation communities listed as endangered at either the Commonwealth or State level will be avoided, where possible 2. Impacts on State-listed vegetation „of concern' will be minimised wherever possible 3. Fragmentation of remnants of vegetation/habitat will be avoided wherever possible 4. Disturbance will be located at the edge of existing remnants where possible 5. Where possible, access tracks and other infrastructure will be located in areas that have already been disturbed.
9.3. A segment of the staff induction program will be allocated to informing staff of the conservation values on the Project site and surrounding areas to increase staff awareness of the species present.
9.4. Clearing of vegetation in Sandy Creek and Well Creek will be minimised to maintain habitat connectivity and provide a movement corridor for small terrestrial fauna species.
9.5. The revegetation plan will include: • planting of a range of native shrubs, trees and groundcover plants from locally-sourced seed; • inclusion of logs, dead trees and stumps sourced from cleared areas in the landscaping / rehabilitation works; • linking of vegetation remnants; • focusing on riparian vegetation to protect waterways; • maintenance of rehabilitation through a rehabilitation monitoring plan; and • management of weeds and pest animals through a pest management plan
9.6. The Pest and Weed Management Plan will be implemented prior to the commencement of construction activities.
9.7. HGPL will consult with relevant local government officers and State Government regional officers on the Pest and Weed Management Plan as required.
9.8. The Project will monitor and control potential pests and weeds on site as outlined in the Pest and Weed Management Plan.
9.9. Weed management strategies will be developed to include: • The present location of weeds will be highlighted and a comprehensive weed spraying program be implemented, prior to the commencement of works. Declared weed species will be treated per the relevant Queensland Department of Employment, Economic Development and Innovation (DEEDI) fact sheet for each particular species; • Monitoring in the form of annual observations by site personnel for weeds of management concern will be undertaken. These will also be conducted following significant rain events particularly in disturbed areas, roadsides, riparian zones and wash down facilities once safe access can be provided; • Wash down facilities will be constructed at access points for vehicles arriving and departing from the Project site. These facilities will be bunded and located away from drainage lines to minimise the risk of weed spread; • All vehicles entering the Project site and leaving properties known to contain declared weeds will be

Proponent Commitment
thoroughly washed down before entering clean areas; ensuring wheels, wheel arches and the undercarriage are free of mud and plant material; • Vehicles will keep to roads or compacted surfaces (preventative) as far as possible, and reduce vehicle movements in wetted soil areas where avoidance is unavoidable; • Vehicles will be cleaned each month to remove accumulated seed and plant material; • Soil and fill material from weed-affected areas will not be transported to clean sites. Minimising soil disturbance has the potential to limit the ability of weeds to become established; • If weeds of management concern are identified, they will be controlled on site in accordance with local best management practice from the Burdekin Dry Tropics Regional Pest Management Strategy (Maunsell Australia Pty Ltd, 2008) and / or the DEEDI Pest Fact Sheets (DEEDI, 2007), and in accordance with practices deemed suitable for the mine site; and • Observations of treated areas to assess the success of declared weed eradication should be undertaken.
9.10. HGPL has discussed the Pest and Weed Management Plan with the landholders. As the Project progresses the Plan will be updated to include the following and further discussed with the landholders: • Confirmation of the weed and pest species found on site; • Selection of herbicides and pesticides to meet the Meat and Livestock Association (MLA) requirements • Establish a notification procedure to the local landholders/graziers to provide details on areas, which have been sprayed to ensure livestock, do not consume feedstock from these areas in accordance with MLA requirements. Consultation with landholders if any chemicals will be used which are on the Great Barrier Reef Marine Park list which could trigger their reporting requirements. If required, further private consultation with potentially affected landholders will be undertaken and will address such impacts from weeds and pests.
9.11. Pest management strategies for the Project site should incorporate strategies from DEEDI Pest Fact Sheets and the Burdekin Dry Tropics Regional Pest Management Strategy – Draft for Public Consultation (Maunsell Australia Pty Ltd, 2008).
9.12. If accidental injuries of native fauna should occur, the methodologies to assess and handle injuries will be developed and directed by suitability qualified persons.
9.13. Project persons operating vehicles in the Project site will be made aware of the presence of these threatened species and the potential for it to be encountered on vehicle tracks.
9.14. As part of developing the proposed Bushfire Management Plan, a bushfire hazard assessment will be completed to assess the vegetation community (i.e. Buffel Grass), slope and aspect to determine the hazard score for the different areas and to understand and mitigate the risk of bushfire. The assessment will note specific risk factors associated with the development, including matters such as the nature of activities, vegetation types, materials to be conducted/stored on the site and persons likely to be present.
9.15. Waterway diversions; levee designs; culvert or bed level crossings will be designed to meet the intent of the required Department of Environment and Heritage Protection (DEHP) guidelines and will be sympathetic to the requirements of fish movements within the mine lease area. For works outside of the mining lease the Proponent will consult with the Department for Agriculture, Fisheries and Forestry to discuss any works interfering with watercourses outside of the mine lease area, and ensure compliance with all applicable legislative requirements. **9.16.** HGPL will provide Fisheries Queensland with a copy of surface water monitoring reports.
9.17. Commitments to the rehabilitation (including timeframes) that will occur on the site are presented as part of the EMP. Rehabilitation time frames will be finalised in the site Rehabilitation Management Plan.
9.18. Any reasonable request for field work data received from DEHP will be supplied in the requested format.
9.19. The current offset policy is the *EPBC Act's Environmental Offsets Policy October 2012,* and will be used in the assessment and development of subsequent documentation and offset plans/strategies.
9.20. HGPL will continue to work with DEHP, the Office of the Coordinator General (OCG) and Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) to develop regional biodiversity plans.
9.21. All site infrastructure will be built to meet the required bushfire rating and mitigation measures, including vegetation clearance will be undertaken prior to construction.

Proponent Commitment
9.22. All revegetated areas will be monitored to ensure long-term groundcover establishment and success. Revegetation techniques will be continually developed and refined over the life of mine through an ongoing process of monitoring at the site and recognition of other industry experiences.
9.23. HGPL commit to undertaking an assessment of „ecological equivalence' of those impact areas containing MNES and State significant biodiversity values that are agreed to be offset with relevant regulators. Ecological equivalence of impact areas will be assessed and quantified after Project approval. A report on ecological equivalence will be provided to DEHP and SEWPaC prior to any vegetation clearing occurring on site. This is currently proposed to occur in March – May 2014 (the most appropriate timing for these surveys) based on advice provided by the DEHP.
9.24. HGPL will investigate corridor enhancement activities such as additional plantings and installation of fauna exclusion fencing, reduced vehicle speed and signage, driving speed limits – opportunities to lower the speed limit on the causeway crossings to 20 km/hr will be investigated, traffic designation, track maintenance, periodic watering of tracks to supress dust emissions, maintenance of vegetation on non-traffic areas.
9.25. The identification and security of the final offset sites will be undertaken in a manner that takes into consideration the specific requirements of the Project, constraints within the region and strategic conservation objectives.
9.26. HGPL will link into local and regional invasive species management programs and a liaison for invasive species management for HGPL (or nominated contractor) to be appointed to liaise with council and landholders including issues regarding the day-to-day management.
9.27. Cumulative impact studies on significant vegetation communities and habitat (as outlined in Appendix O – Cumulative Impacts Assessment) will be undertaken.
9.28. HGPL will use existing tracks and corridors for road and infrastructure access in the UG mining areas for placement of ventilation and associated infrastructure.

C.10. Aquatic Ecology and Stygofauna

Proponent Commitment
10.1. The diversion of Little Sandy, Rocky and Middle Creeks will mimic the natural materials and geometry of the original creek as much as practicable.
10.2. Riparian vegetation clearing for the proposed creek diversion will be conducted in a staged manner, to allow fauna to migrate to adjacent habitat areas.
10.3. The creek diversion rehabilitation will be monitored to ensure the vegetation is stable and self-sustaining.
10.4. Sediments traps will be designed and installed downstream of all land disturbances (such as water storage dams) in order to remove sediment from storm water which flows over such land disturbances.
10.5. A water quality, sediment quality and aquatic-fauna monitoring program will be initiated and continued throughout the project life. This program addresses the early detection and recording of Project impacts upon local surface water courses, thereby allowing mitigation strategies to be altered or developed.

C.11. Surface Water

Proponent Commitment
11.1. Storm water design (around the accommodation village) will be undertaken in accordance with the current version of the Queensland Urban Drainage Manual (DERM 2007), Australian Runoff Quality – A guide to water sensitive urban design (2005), and requirements of the local Regional Council
11.2. A diversion will be provided to divert stream flows around the open-cut pit.

Proponent Commitment
11.3. Establishment of vegetation on disturbed areas of diversions will be undertaken as soon as practicable before commissioning.
11.4. The diversion active channels will allow for replication of substrate conditions similar to the existing stream substrates of significance for geomorphic processes, water quality, vegetation, and aquatic habitat features as required.
11.5. Hydraulic performance including channel velocities, stream power and shear stress will be guided by the Australian Coal Association Research Program (ACARP) (2002). Maintenance of Geomorphic Processes in Bowen Basin River Diversions - Final Report, Research Projects C8030 and C9068.
11.6. A comprehensive monitoring program for the proposed stream diversion will be developed and implemented.
11.7. Levees will be provided to protect the open cut pits from flooding for events up to 1:1000 AEP
11.8. The Proponent will implement a Water Management System to manage water flows onto, within and from the site in order to safeguard mine operations and minimise the Project impacts on downstream water quality.
11.9. Water storages will be sized using the Site Water Balance Model and be sized to contain mine affected water so that the probability of overflow is less than 1:100 AEP.
11.10. No controlled discharges will occur from the Project
11.11. All potential uncontrolled release points from the Project will be identified and regulated as release points into the receiving environment.
11.12. A water quality monitoring program will be implemented to monitor and record the effects of the release of contaminants on the receiving environment with the aims of identifying and describing the extent of any adverse impacts to local environmental values, and monitoring any changes in the receiving water.
11.13. Contaminants will not be discharged above levels that will contaminate downstream water supplies drawn from Degulla Lagoon.
11.14. The water treatment plant will be sited in a location where the floor level can be placed above the 0.5% AEP.
11.15. The accommodation village will be sited to be safe from flood events up to at least 1:100 AEP.
11.16. The evacuation route from the accommodation village will be to the airport and the access road will be designed to be accessible during flood events up to 1:100 AEP event.
11.17. There will only be one constructed diversion channel from Little Sandy Creek into Middle Creek. The constructed diversion channel will also intercept Rocky Creek and divert this into Middle Creek.
11.18. The Proponent will consult with the landholder as part of the development of the on-going comprehensive geomorphological baseline monitoring and associated life of mine and mine closure adaptive management plan for the waterways.
11.19. The Proponent acknowledges and is planning for the requirement that a more comprehensive assessment of the diversions will need to be undertaken as part of the water licence process under the *Water Act 2000*. This will include more comprehensive geotechnical/geological investigations to inform design, rehabilitation and potential risks that will be mitigated in the final design.
11.20. The Proponent will negotiate agreements with upstream Alpha Coal Project regarding the increase in levee heights that the Alpha Coal Project will need to consider to accommodate the afflux from the Kevin's Corner Project in their project design.
11.21. The Proponent will discuss progressive findings of investigations and detailed design analyses with the regulatory agency (DEHP) that is responsible for levees licensed as regulated structures under the *Environmental Protection Act 1997* (EP Act).
11.22. HGPL will meet with BRC to discuss the location of the gauging stations within the context of the broader network of flood level stations.
11.23. The Proponent commits to adjustment of pit wall locations with a sufficient set back from the levees to provide the appropriate factor of safety as it is not considered feasible to move the levees closer to the creeks

Proponent Commitment
without potentially introducing more stream instability risk and afflux impact to the upstream Alpha Coal Project.
11.24. Small diversion bunds directing floodplain runoff to properly engineered rock chute structures will be installed to minimise bank erosion.
11.25. Cattle will be excluded to a width of at least 30 m from the top of bank (within the bed and banks of subsided watercourses).
11.26. In the event that the on-site monitoring program highlights the need for engineered works to maintain the stability of a watercourse, the design, monitoring, maintenance and potential impacts of these structures will be incorporated into the SMP. The design and assessment of any engineered structures will be performed by a Registered Professional Engineer of Queensland (RPEQ).
11.27. All groundwater monitoring will be conducted and assessed by a suitably qualified independent expert.
11.28. Land degradation types and distribution will be mapped across the MLA
11.29. Between each five-yearly survey, annual rapid geomorphic assessments will be carried out to identify occurrences of accelerated erosion or sedimentation.
11.30. Event-based monitoring will also occur within 6 months of a 10-yr ARI event or greater flood across the mine lease area.
11.31. A full survey of the geomorphic environment will be undertaken at the end of the mine life prior to relinquishment of the mining lease.
11.32. At the completion of any restoration works, a detailed cross-sectional survey of each reach will be conducted and a photographic record of the condition of the bed and banks made, with ongoing condition monitoring also conducted.
11.33. In order to appropriately document rainfall and flow conditions a weather station will be established adjacent to the proposed airport and stream flow gauges will be established on Sandy Creek and on Middle Creek as described in the EMP. **11.34.** Additional stream gauging stations will be established on Little Sandy Creek, Rocky Creek and Well Creek to assess flow condition during underground mining operations.
11.35. In areas where less active bank erosion develops, large woody debris will be placed in-stream to encourage the deposition of sediment and revegetation over time.
11.36. Increased flow, velocity, and stream power will occur in the existing channels of Middle and Well Creek downstream of the diversion. In these reaches the existing vegetation will not be disturbed which will assist to resist increased stream power. Monitoring will be undertaken to identify if the increased flood flows will eventuate into stream response to increase the channel capacity.
11.37. Between each five-yearly survey, annual rapid geomorphic assessments will be carried out to identify occurrences of accelerated erosion or sedimentation. This may include stream bend erosion, gullying, tunnel gullying, aggradation at stream confluences, bank weakening due to subsidence etc.
11.38. Event-based monitoring will also occur within 6 months of a 10-yr ARI event or greater flood across the mine lease area. This could then be repeated within 2 years to document the recovery, and the 5-yearly surveys continued after that.
11.39. HGPL will ensure the Surface Water Run-off Dam #1 complies with the WRP during the detail design phase.
11.40. HGPL will engage with DNRM to further discuss the Little Sandy and Rocky Creeks' diversion proposal, prior to submitting a water licence application under the Water Act 2000.
11.41. Therefore further investigation of the characteristics of sediment sources is warranted in order to establish where the watercourse sediment is coming from, how much is being delivered, how fast it is being transported through the system, and what effects arise downstream of the MLA. This would then inform the development of the design of the detailed monitoring program that will be carried out during the mine life as identified in the EIS Geomorphology Technical Report. This monitoring data will provide the necessary basis for adaptive management of the stream sediment loads during the mine life.

Proponent Commitment
11.42. Towards the end of the mining activities, and before the mine license is relinquished, a detailed water course geomorphology status report will be prepared, and this would be required to develop any further mitigation measures needed to ensure that there is no impact on the long-term post-mine structural integrity and performance of Middle and Well Creeks downstream of the diversion.
11.43. A cumulative impacts assessment will be undertaken to address hydrology, hydraulics, sediment delivery and transport in the water courses, and channel geomorphology impacted by the Kevin's Corner and Alpha Coal projects.
11.44. This SEIS makes commitments to detailed cumulative impacts studies and also presents the scoping suggested for a cumulative impact assessment and adaptive management of potential impacts on stream geomorphology.
11.45. The results of the geomorphology cumulative assessment will be used to inform a detailed monitoring and mitigation plan to be implemented during the mine life. Towards the end of the mining activities, and before the mine license is relinquished, a detailed water course geomorphology status report will be prepared, and this would be required to develop any further mitigation measures needed. HGPL to undertake a Geomorphological study to define impacts on stream erosion, stream sedimentation and water course stability to be commenced before start of construction. This study will also detail combined mitigation strategies for the mines and identify the residual risks post mitigation.
11.46. The following stages of work are proposed and will be included in either the diversion monitoring program or the subsidence management monitoring plan (for Middle Creek): 1. Detailed assessment of Middle Creek channel geomorphology to identify bed and bank characteristics, focussing on changes in bed slope, bank height and erosion potential, existing bend erosion, and sediment characteristics. As part of this work the HEC-RAS and TUFLOW modelling could be field verified. 2. Based on the above baseline study, a detailed monitoring programme will be developed to determine the dynamics of the pre-mine sediment transport and watercourse geomorphic system, in particular identifying the parts of the channel that required most monitoring effort. Stages 1 and 2 should be completed prior to the commencement of the diversion works and mining. Monitoring will be carried out at regular intervals throughout the mine life. Annual site inspection surveys, and more detailed assessments every five years or after a 5-yr ARI flood event will be carried out as per the requirements of the site monitoring programs. 3. During the mine life, adaptive management responses would be instigated to address mining-related channel geomorphic instability as may be identified by the monitoring program. Examples of possible mitigation are: zones of accelerated bed and bank erosion could be mitigated with timber pile fields as have been successfully used in the Bowen Basin; if sediment build-up occurred it could be mechanically removed to avoid downstream transfer of increased sand load; where bank erosion was causing stream widening to occur the channel could be mechanically widened, a floodplain formed, and the sediment disposed of within the mine area and away from the watercourse. 4. Towards the end of the mine life (within 5 years of closure) it would be appropriate to undertake a detailed watercourse geomorphology status survey to determine what channel and out of channel/floodplain geomorphic responses to increased flow and channel subsidence had occurred in Middle Creek. At that stage, with geomorphic system responses underway, it should be possible to more robustly predict how the system is likely to evolve in the future and to develop final mitigation measures to put in place that would provide for sustainable post-mine watercourse geomorphic development.
11.47. A detailed survey of the MLA geomorphology will be undertaken prior to mining activities. The baseline monitoring has commenced and will be completed prior to the commencement of construction. This material will be compiled into a descriptive and interpretive reference geomorphological report supported by relevant GIS databases (such as landform, slope, watercourse and other mapping data).

C.12. Groundwater

Proponent Commitment
12.1. Registered springs, shown on Figure 12-4 (EIS, Volume 1, Section 12 - Groundwater) will be monitored to establish whether mine activities will impact on groundwater discharge to the north of MLA70425.

Proponent Commitment
12.2. Groundwater-surface water interaction will be assessed once nested bores are constructed within the Sandy Creek alluvium and deeper coal seams.
12.3. A minimum of 12 groundwater baseline monitoring samples will be collected within 24 months to allow for the drafting of trigger levels, to be mutually agreed with DEHP. This will include groundwater level triggers.
12.4. The latest predictive groundwater modelling results will be made available to neighbouring groundwater users to allow them to see which bores may be impacted by mine dewatering over time.
12.5. Additional groundwater monitoring bores will be added to the existing monitoring network over time.
12.6. The existing groundwater monitoring network will be expanded over time to allow for groundwater impact evaluation across the site, as mining expands to the west.
12.7. A detailed dewatering scheme will be developed, including bore optimisation, timing, and layout, using the predictive groundwater modelling once several envisaged dewatering pilot bores, borefields, and systems have been constructed and assessed prior to coal extraction.
12.8. Water and waste storage facilities will be designed constructed and operated to avoid any potential seepage risk.
12.9. HGPL will construct additional groundwater monitoring for Kevin's Corner to assist in validating model predictions and assessing any level changes in the underlying units.
12.10. Monitoring to validate modelling predictions, groundwater conceptualisation, and the current assessment of cumulative impacts will be undertaken through the life of mine and post mining.
12.11. Modelling audits of HGPL's groundwater models will be undertaken on a regular basis (no longer than every 3 years). These modelling results will be provided to the relevant administering authority for review.
12.12. HGPL will enter into legally binding Make-Good Agreements with landholders whose bores could potentially be impacted by the operations of the mine prior to construction. These Make-Good Agreements have detailed requirements to quantify the water quality and production of impacted groundwater wells, to monitor these wells for impacts and to compensate the landowners for impacts on these groundwater resources.

C.13. Air Quality

Proponent Commitment
13.1. There are currently two other residences within the study area (Hobartville and Wendouree homesteads), however these two residences are within the boundary of MLA 70426 (the adjoining Alpha Mine MLA, owned by Hancock Prospecting Pty Ltd (HPPL)), and will be acquired by the Proponent.
13.2. Controls incorporated in the dispersion modelling that will be implemented onsite include: • Watering during processing at the Coal Handling and Preparation Plant (CHPP) using water sprays; and • 3/4 covered conveyors resulting in reduced emissions during high speed winds.
13.3. Dust suppression measures will primarily include the application of water to control dust emissions such as: • Watering of haul roads up to best-practice level (2 litres/m^2/hour of water applied)
13.4. In the event that adverse conditions are encountered during cumulative operation of Kevin's Corner Project and the Alpha Coal Project (Mine), additional dust suppression measures may have to be implemented. The requirements for these additional dust suppression measures will be determined through the Operational and On-Site Meteorological Monitoring Program.
13.5. Rehabilitation of exposed surfaces will be undertaken progressively as mining and stockpiling activities are completed. A detailed Rehabilitation management Plan will be developed for the Project, which will include the use of fast-growing temporary cover material to accelerate the effectiveness of dust controls. Improving the effectiveness and time for rehabilitation measures will result in reduced dust emissions from exposed areas.
13.6. In relation to air quality, the following operational procedures will be implemented in order to meet targets for air quality performance:

Proponent Commitment
• Maintenance of water spray equipment and engineering controls to minimise dust emissions; • Sufficient number of watering trucks to allow for continuation of dust suppression when one or more truck is out of service; • Monitoring of ambient air quality in the vicinity of the mine; • Manage topsoil stripping so that dust does not become a safety hazard or severe nuisance; • Restrict land disturbance to that necessary for the operation and minimise the area of land disturbed at any one time; • Maintain a register of dust complaints; • Investigate all complaints about dust promptly and take appropriate action to reduce dust nuisance; and • Review dust monitoring data to identify trends and implement corrective actions if necessary.
13.7. Due to the varying depths of pit activities, particular consideration will be paid to operations that are close to the natural surface level, such as truck and shovel operations and overburden dumping. To prevent worst-case conditions from occurring, mine planning will give consideration to implementing additional dust control measures for operations that are close to the natural surface level.
13.8. The objective of the proposed operational monitoring program is to monitor particulates (TSP, PM_{10} and $PM_{2.5}$) and dust deposition within the region predicted to be directly impacted upon by particulate generating activities. This will apply to the construction and operational phases of the Project. The monitoring program will allow the Proponent to identify the effectiveness of proposed mitigation actions and implement additional actions dependent on the impacts measured. It will also allow calibration and validation of the dispersion modelling undertaken to predict the impacts. **13.9.** Data from the operational monitoring program will be used to demonstrate compliance with the EPP (Air) Objectives and Project Goals.
13.10. • The Project will achieve and maintain the level of dust control outlined in the EA. • The Project will meet the Ambient Air Monitoring program requirements. • The Project will investigate all substantiated dust complaints. • The Project will implement corrective action resulting from complaints investigations as required. • All monitoring and sampling techniques will be consistent with the DERM's Air Quality Sampling Manual and applicable Australian Standards.
13.11. A Coal Dust Management Plan (CDMP) will be developed, specific to the mitigation of coal dust emissions from the rail loop. The recommendations outlined in the QR Network 2010, CDMP, will be incorporated into the CDMP for the Kevin's Corner projects.
13.12. Coal surface veneering or full coverage will be applied to all coal wagons as per the commitments of the QR Network CDMP.
13.13. HGPL will participate in future air quality cumulative impact assessments on request of the regulating authority.
13.14. HGPL agrees for all relevant data submitted to DEHP as a requirement of the EA Conditions to be made publicly available.
13.15. HGPL will ensure that mitigation measures to minimise impacts on air quality will be implemented to ensure that the air quality at sensitive receptors does not pose an unacceptable risk to human health.

C.14. Greenhouse Gas Emissions and Climate Change

Proponent Commitment
14.1. The Proponent will participate in the Energy Efficiency Opportunities (EEO) Program with respect to the covered greenhouse gas (GHG) emissions from the Project.
14.2. A GHG inventory will be maintained from construction onwards with reporting requirements to the Greenhouse and Energy Data Officer filled annually. The Project will report under the NGER Act given that

Proponent Commitment
emissions for the Project's Scope 1 and Scope 2 emissions will exceed the 25,000 tonne CO_2e threshold.
14.3. Due to potential climate change, risk management measures will be adopted by the Proponent in the development of the Project to address the High and Medium risk scenarios including increased flood risk, reduced process water availability, increased dust generation, unsuccessful rehabilitation planting and increased maintenance costs for infrastructure.
14.4. HGPL will be liable to pay the Australian Government's "Carbon Tax". HGPL will pay per tonne of carbon they release into the atmosphere from their scope 1 and 2 emissions.
14.5. The following measures will be considered and implemented where practicable: • Material movement will be efficient by minimising rehandle and utilisation of underground methods (i.e. limited waste fragmentation, handling and elevation). • Onsite bulk materials transport (i.e. coal and potentially overburden) will be via conveyor wherever practicable rather than by truck. • Transport footprint will be minimised by operating shuttle services for project personnel. • Bulk materials will be delivered to site by rail freight rather than by road, depending on the configuration of Abbott Point port operations. • Plant and equipment: – Energy efficiency ratings will be investigated and higher ratings the preferred option – Plant and equipment will be maintained in a proper condition; and – Plant and equipment will be operated in a proper manner – Roads will be maintained in good order to allow mobile fleet to operate fuel efficiently. • Blasting activities will be optimised to minimise double handling. • Supporting infrastructure will aim to be energy efficient using technology to minimise latent energy demand. This includes the use of smart controllers to turn off air conditioning systems when not in use and to prefabricate and prepare project inputs off-site with greater efficiency and less waste.

C.15. Noise and Vibration

Proponent Commitment
15.1. All construction and operational plant will be appropriately maintained, and where practicable, fitted with engine covers and silencers/mufflers in order to minimise noise emissions from the site to the best practicable extent.
15.2. Noise and vibration monitoring will be carried out in accordance with the Environmental Authority.
15.3. The proposed on-site accommodation buildings will be air conditioned and provided with mechanical ventilation allowing windows to be kept closed. The acoustic design of the accommodation village buildings will ensure that the EPP (Noise) internal noise criteria will be met at all times. Further physical noise mitigation measures, such as noise barriers etc., will be considered by the Proponent during design of the accommodation village, to increase external noise amenity.
15.4. The use of explosives will be in accordance with the relevant Australian Standards (i.e. AS 2187 Explosives – storage, transport and use) and all state legislation (i.e. *Explosive Act 1999*).
15.5. Blasting will be avoided if values of airblast overpressure in noise-sensitive places are predicted to exceed acceptable levels. If this is not practicable, blasting will be scheduled to minimise noise annoyance.
15.6. The predicted blasting noise and vibration levels will be refined based on additional site specific constants obtained once the exact locations for blasting are known.

C.16. Waste

Proponent Commitment

Proponent Commitment
16.1. During the first year of mining, the coarse rejects will be encapsulated with non-acid forming (NAF) overburden at the out-of-pit overburden emplacement areas. From around Year 2 to the end of mine life, the coarse reject material will be placed in the in-pit voids between the dragline overburden/spoil. Truck-shovel pre-strip overburden materials will be used to progressively cover the reject areas with NAF overburden material as the working face progresses down dip.
16.2. Tailings will report to a purpose built Tailings Storage Facility (TSF) for the first five to seven years followed by in-pit disposal of tailings to the Northern Open Pit for the remaining life of the mine.
16.3. Overburden material will predominantly be stored within the open pit from Year 2, although an out-of-pit overburden emplacement area adjacent to the low walls of the Northern and Central open pit areas will accommodate material from the box-cut developed during the first year of mining.
16.4. As a precautionary measure, contact water from raw and product coal stockpiles materials will be contained to avoid interaction with clean site waters.
16.5. If there is an increase in acid mine drainage (AMD) potential due to issues such as greater than predicted potentially acid forming (PAF) quantities or lower than anticipated PH levels, consideration will be given to additional risk management methods such as selective placement, early encapsulation or lime amendment.
16.6. Out-of-pit overburden will be managed to ensure that saline and/or sodic materials report to the core of storage facilities. Precautions will be taken to prevent water flow over the dispersive materials of overburden dumps by avoiding placement at the final top surface and final surface of the outer slopes and batters.
16.7. The occurrence of any PAF overburden materials associated with economic and uneconomic coal seams with a significant capacity to generate acid will be further delineated in future planned infill drilling programs
16.8. Any overburden associated with coal units such as coal ply partings less than 30 cm in thickness and some roof and floor materials will report with coal to the CHPP and will therefore report as coarse reject. Any PAF uneconomic coal that is mined but nor processed will also report directly to coarse reject storage facilities.
16.9. Any coal ply parting greater than 30 cm thickness that is NAF or low capacity PAF will be selectively left at the floor of the pit (or if storage capacity is unavailable at the pit floor, will report to an alternative in-pit storage location) and be covered within four weeks with reduced permeability NAF overburden material
16.10. Any PAF parting or roof and floor materials will be selectively handled and report to either out-of pit (during Year 1) or in-pit coarse reject storage areas (after Year 1).
16.11. Some coal seam roof, floor and parting materials located directly adjacent to or within the economic and uneconomic coal seams below the base of weathering may be PAF and these PAF materials will be identified and handled in a similar manner to PAF coarse reject materials at the project (i.e. selective handling, compaction, possible lime amendment and encapsulation within a thick layer of NAF overburden). Visual identification of these materials through open-pit mining geological control coupled with pre-mining and ongoing geochemical sampling and testing of coal seam and near coal seam materials will be used to delineate the extent of any PAF overburden materials and ensure that these are selectively handled and managed in an appropriate manner. For tailings, lime amendment will be used if the tailings are less benign than predicted and the pH of the tailings decant water decreases below the predicted range of pH 5-6.
16.12. All coarse reject materials will be paddock dumped and compacted in approximate 1-2 m layers using dozing and vibrating or square roller equipment. Coarse rejects will be isolated with reduced permeability NAF overburden within 4 weeks before being encapsulated with a thick layer of NAF overburden within 3 months.
16.13. From Year 2 to end of mine life, the coarse reject material will be placed in the in-pit voids between the dragline overburden (spoil). Preliminary isolation with reduced permeability material within 4 weeks and encapsulation with a thick layer of NAF overburden within 3 months will be utilised to manage the potential for AMD. Truck-shovel pre-strip overburden materials will be used to cap the reject areas. Coarse reject placement will be sequenced such that capping of the rejects will be completed progressively as the working face progresses down dip
16.14. The TSF will be designed to ensure that risk of seepage to the underlying sediments is minimised.
16.15. During operations small scale field tests on tailings materials will be carried out under actual site conditions. The potential merits of lime amendment of tailings reporting to the TSF will also be assessed by ongoing monitoring of the tailings geochemical characteristics, decant water quality and any collected seepage water quality.

Proponent Commitment
16.16. A cover system will be utilised for TSF closure and topsoil will be placed onto the re-profiled final landform slopes
16.17. The Proponent will continue ongoing infill drilling programs and operational geochemical characterisation of coal and mining waste materials from the Project area to verify the predicted geochemical characteristics of these materials.
16.18. Acquired geochemical data will be used to refine the management strategies adopted for coal and mining waste materials. For future work, in addition to standard acid-base and metals testing (static tests) and kinetic leach column tests, geochemical characterisation of overburden materials will include assessing the general soil properties (sodicity, exchangeable cations) of selected mined waste materials to confirm their suitability for use in surface revegetation and rehabilitation activities.
16.19. Surface water and leachate derived from, or in contact with, coal and mining waste materials will be monitored to ensure that water quality is being managed and not significantly compromised by proposed site management practices. Potentially impacted surface waters will be primarily managed by retaining water on-site. This water will be reused in the site water management system. This will be particularly important in the CHPP and open pit areas where stored materials may produce brackish run-off water.
16.20. Coal and mining waste materials will be monitored for geochemical characteristics (pH, EC, acidity, alkalinity, sulphur species (total and sulphide) and ANC) on a monthly basis until such time as the variability of the geochemical characteristics of these materials is well defined (approximately 12 months).
16.21. Surface and seepage water at coal and mining waste storage areas will also be monitored on a monthly basis (as well as opportunistically during rainfall events when access is available) and tested for pH, EC, Total Dissolved Solids (TDS), acidity and alkalinity, major anions (sulphate (SO_4), chloride (Cl), fluoride (F)), major cations (calcium (Ca), magnesium (Mg), sodium (Na) and potassium (K)) and trace metals (aluminium(Al), arsenic (As), antimony (Sb), boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), selenium (Se), silver (Ag), uranium (U), vanadium (V) and zinc (Zn)) will be included in the range of parameters tested in these water samples, initially on a quarterly basis (for 12 months) and then on an annual basis throughout the life of mine.
16.22. On a 95th percentile basis, should the pH of the TSF seepage water decrease below pH 5 or the EC increase by more than 100% from typical background values, the full range of parameters described above will be included in the test suite.
16.23. The Project will adopt material characterisation and management measures to effectively manage coal and mining wastes generated by the construction, operation and decommissioning of the Project.
16.24. Coal and mining wastes will be effectively managed by material type to minimise operational and longer term residual impacts on the environment.
16.25. Development and implementation of a site-specific Mining Waste Management Plan (MWMP) and effective monitoring and reporting will ensure that the management of coal and mining wastes at the Project are consistent with relevant legislation and guidelines and leading industry practice.
16.26. Wastes generated during the construction and operations phase of the project will be managed according to a preferred waste management hierarchy promoting minimisation of waste and options for on site reuse, recycling and treatment initiatives. Where wastes are hazardous or pose a risk of environmental contamination, they will be stored in suitably protected facilities and removed by licensed contractors for disposal in an approved facility. The Proponent will keep detailed records of waste removed from site, including details of contractors, treatment and final destination.
16.27. Sewage from the LIA, MIAs, CHPP and accommodation village will be collected and transported to the sewage treatment plant (STP) and the effluent disposed to sub-soil irrigation or reused for industrial purposes. Solids by-products from STP will be removed by a contractor and transported to a licensed disposal facility. Sewage from the underground MIAs (in remote areas) will be collected in septic tank systems and trucked back to the STP for treatment.
16.28. The burning of cleared vegetation (if required) will be done with the approval of the Queensland Fire and Rescue Service and in accordance with an agreed fire management plan.
16.29. Standard procedures for the storage, handling, disposal and spill response for potentially hazardous waste materials will be adopted. This will require the use of spill containment material and spill clean-up kits located at

Proponent Commitment
workshops. Sites that become contaminated will be investigated, managed and remediated in accordance with the requirements of the contaminated land provisions of the EP Act.
16.30. A suitably engineered landfill will be constructed on site and managed as a long term waste disposal solution for residual wastes generated from the Project.
16.31. Effective rehabilitation and appropriate management measures will be implemented to avoid residual impacts on environment values such as water quality and air quality as a result of construction and operation of a general solid waste landfill on site.
16.32. A MWMP will be developed similar to that developed and utilised at the Alpha Bulk Sample Test Pit operation in 2011 and an infill drilling and geochemical testing program is already underway.
16.33. Precautions will be taken to prevent water flow over the dispersive materials of overburden dumps, by avoiding placement at the final top surface of the outer slopes and batters
16.34. Waste dumps have been designed with sufficient buffer area which will contain sediment and erosion within the mining lease boundary.
16.35. The overwhelming majority of waste rock will have negligible sulphide content and be NAF. A small proportion (1%) of waste rock materials located close to coal seams may have some potential to generate acid and these will either be managed in the open pit being covered with NAF spoil where they occur, or report to coarse reject storage locations for compaction, possible lime amendment and encapsulation within a thick layer of NAF overburden. Visual identification of these materials through open-pit mining geological control coupled with pre-mining and ongoing geochemical sampling and testing of coal seam and near coal seam materials will be used to delineate the extent of any PAF overburden materials and ensure that these are selectively handled and managed in an appropriate manner.
16.36. Suitable vegetation will be reused to provide fauna habitat on-site, before greenwaste is shredded and chipped for reuse in rehabilitation, with the remainder stored for use in on-site composting operations.
16.37. The Kevin's Corner landfill does not anticipate permanent landfill infrastructure for storage of liquid wastes; however will have a designated hardstand area for set-down of waste transport containers, in the event of unforseen weather conditions limiting waste movement.
16.38. The landfill design will incorporate a leachate collection and drainage system within the waste disposal unit, and that system will convey collected leachate to an on-site holding tank.
16.39. The Proponent will develop a comprehensive landfill operations plan and an EMP in accordance with DEHP's Landfill siting, design, operation and rehabilitation guideline document.
16.40. Putrescible waste will be disposed of on site into an approved engineered landfill or facility. Site personnel will be trained in the operation and procedures for this installation to reduce the potential for unauthorised waste disposal at this site.
16.41. HGPL to work with Council and other Galilee Basin proponents to explore options for co-location of recycling facilities/collection points and or disposal options to assist the community address waste reduction guidelines.

C.17. Transport

Proponent Commitment
17.1. Degulla Road upgrades and construction will be completed to required standards and design guidelines as stipulated by the Department of Transport and Main Roads (DTMR). This includes maintaining responsibility for all works associated with the closure of Degulla Road.
17.2. The Proponent will implement a FIFO method of transport for the majority of employees.
17.3. Logistics plans will be prepared for individual components (i.e. each separate vehicle) as well as the entire program of planned movements for any Over Dimensional vehicles.
17.4. Maintenance works, as detailed in the Infrastructure Agreements, will be undertaken where required due to

Proponent Commitment
degradation of road infrastructure from project vehicles during the construction and operations phases.
17.5. Infrastructure/maintenance agreements with BRC for Degulla Road and Jericho-Degulla Road will be finalised prior to construction.
17.6. Infrastructure/maintenance agreements with DTMR for Clermont-Alpha Road to the Clermont turn off will be finalised prior to construction.
17.7. Detailed baseline pavement assessments for Degulla Road, Jericho-Degulla Road, Clermont-Alpha Road and Capricorn Highway (Alpha to Gemfields) will be conducted prior to construction and regular pavement inspections will be undertaken during the construction and operations phases.
17.8. HGPL will revise the traffic impact assessment should changes be proposed to mode of transport for construction and operations workforce.
17.9. HGPL will reassess the Capricorn Highway/Gregory Highway (North) and Capricorn Highway/Gregory Highway (South) intersections prior to construction and will address in the revised RIA, required six months prior to start of construction.
17.10. A complete Road Use Management Plan RUMP will be developed and implemented prior to construction in order to manage the risks and impacts of any transport related issues.
17.11. Following the development of the Kevin's Corner RUMP, and further discussions with the potentially impacted existing road users, the cumulative impacts assessment report will be updated to reflect these findings
17.12. HGPL will consult with school bus operators and school principals when developing the RUMP to determine requirements for maintaining safety of children alighting and disembarking from bus services and for the interaction of haulage vehicles and school bus operations.
17.13. The RUMP will include detail on the movements of over- dimensional and excess mass vehicles.
17.14. HGPL will engage with the Regional Traffic Coordinators as part of finalisation of the RUMP, six months prior to construction.
17.15. Consideration will be given to the Rest Area and Stopping Place (RASP) Master Plan information during the preparation of the RUMP.
17.16. HGPL will consult DTMR and key stakeholders on the development and implementation of RUMP including consideration of road conditions; education and engagement of employees and stakeholders; and links to the Fit for Work- Fatigue Management Procedure. A Fatigue Management Plan will be included as part of the RUMP.
17.17. Consult with key stakeholders on the development and implementation of a Traffic Management Plan (TMP) including on-road traffic control and prior advice (advertising etc.) to minimise the impact of road disruptions for the local community; and education and engagement of employees and stakeholders.
17.18. HGPL will liaise with BRC during preparation of the Road Impact Assessment (RIA), TMP, and RUMP.
17.19. A complete TMP and, if required as a result of the RUMP, a Logistics Management Plan will be developed and implemented prior to construction.
17.20. Review and update vehicle numbers as needed to inform development of RUMP and TMP through the life of the Project.
17.21. The construction of the rail spur and access road will impact the existing transport infrastructure networks as per the impact assessment undertaken within Section 6.5 and Section 17 of the Kevin's Corner EIS (HGPL 2011). To ameliorate any potential impacts to the landholder, the Proponent will reinstate any damage to on-farm infrastructure and utilise the mitigation measures proposed in Section 6.5 of the Kevin's Corner EIS (HGPL 2011).
17.22. HGPL will incorporate RIA findings into the Infrastructure Agreements, RUMP, and TMP.
17.23. HGPL will include the expected truck movements on public roads to and from the quarry as part of the TMP and the RUMP.
17.24. Post final design and construction schedule, HGPL will update the RIA and RUMP six months prior to construction and the TMP three months prior to construction, to manage Project-related construction and operational phase traffic for ongoing safety, efficiency and existing condition of the State-controlled road network.
17.25. HGPL will include a clause in the heavy vehicle freight contract to ensure that Clermont-Alpha Road from

Proponent Commitment
Clermont to the intersection with Eulimbie road will not be utilised by contractors and subcontractors as it is currently unsuitable for commercial vehicles. Checks will be undertaken on vehicles arriving at the mine site to monitor compliance.
17.26. HGPL commits to joining the Southern Galilee Basin Round Table to determine cumulative impacts which can ensure a more equal split of responsibility for impact mitigation by all proponents developing the Galilee Basin.
17.27. HGPL will progress stock route realignment by ongoing liaison with affected landholders and the BRC and appropriate State agencies.
17.28. Rail will be utilised for freight where possible in order to reduce the impacts of heavy vehicle traffic on the roads.
17.29. Stakeholder consultation will be undertaken in relation to the design and construction of bypass roads prior to construction.
17.30. HGPL will give further consideration to park rest-up areas as part of the RIA and RUMP finalisation, six months prior to construction.

C.18. Indigenous Cultural Heritage

Proponent Commitment
18.1. Cultural heritage surveys will be undertaken by Wangan & Jagalingou representatives accompanied by technical advisers (archaeologists) as part of the cultural heritage processes established in the CHMP. Detailed cultural heritage survey reports will be prepared for the Wangan & Jagalingou People. Each report will culminate in a management plan, which will provide guidance for the way in which Aboriginal cultural heritage defined by the cultural heritage survey will be managed before construction commences and during the Project.
18.2. Where avoidance is possible, the preparation of site-specific management plans that provide clear directions and processes for protection of the area or object will be drawn up so that accidental harm during project activities is avoided.
18.3. Cultural awareness training will be provided to personnel, with the intention of training people involved in the Project in avoidance and protection of known cultural heritage sites, what cultural heritage may reasonably be in the landscape, and what to do in the event of a find of cultural heritage not previously defined during the cultural heritage survey.
18.4. HGPL will be aware of any future Indigenous consultation opportunities through regular communication with interested groups throughout the life of the Project. HGPL has also committed to be a member of the Barcaldine Regional Negotiation Table which will allow regular project updates and early identification of participation opportunities.

C.19. Non-Indigenous Cultural Heritage

Proponent Commitment
19.1. The Proponent will take into account each of the heritage sites and places located within its project area, and, where possible, avoid impacting on these sites, or if this is not possible, implement the relevant mitigation measures as outlined in the EIS technical reports.
19.2. The Proponent will prepare an Archaeological Management Plan (AMP) for the management of the nineteenth century coach route and associated elements which exist with the project area. The AMP would provide clear management and mitigation measures to protect and conserve cultural heritage values associated with the coach route network within the mining lease for the life of the Project as far as practicable. The AMP would also include site-specific guidelines and management protocols for each of the previously identified sites, as well as for incidental finds.

Proponent Commitment
Accordingly we will commit to the development of an AMP to manage heritage values associated with the coach route which includes the management of KC 01 - Burgess hotel.
19.3. EMP's developed for the Project should include a procedure for managing unexpected cultural heritage material or sites that may be encountered, including management of archaeological places of state significance under Part 6 of the *Queensland Heritage Act 1992.*
19.4. An archival recording, including detailed photography, site plans and related drawings, will be undertaken for the Cudmore Cottage site (KC04) prior to earthworks in the Mine Area.
19.5. A historical archaeologist will be appointed during construction phases of the project, so that a call-out can be made if potential archaeological material is noted.
19.6. The Proponent will undertake a bi-annual survey of the condition of all heritage items identified during construction on the study area. Any damage to items will be catalogued and actions taken to ensure that the process that caused the damage is avoided as far as practicable and that training material for site personnel can be updated with current information.

C.20. Social

Proponent Commitment
20.1. The Proponent will work with BRC to identify and contribute (where possible) to regional development that is supported by the relevant plans developed under the *Sustainable Planning Act 2009* or *Local Government Act 2009* e.g. Community Plans
20.2. The Proponent will establish and maintain the Alpha Community Development Fund.
20.3. The Proponent will work with local businesses and service providers to minimise the negative Project impacts on their operations.
20.4. The Proponent will continue to support community development programs, community organisations and opportunities in the region.
20.5. The Proponent will establish a Community Liaison function (either a dedicated person or group) tasked with managing relationships in the community.
20.6. The Proponent will develop a Local Employment Plan and a Local Industry Participation Plan for the Project.
20.7. The Project and council will explore road safety programs in conjunction with local police and emergency services providers.
20.8. The Proponent will continue to work with relevant stakeholders (including the Police, government, emergency service providers) and area residents regarding traffic and transportation and will develop an effective TMP, Emergency Management Plan and ensure effective traffic management.,
20.9. The Proponent will work with key stakeholders including councils, social service providers and emergency service providers to address issues of substance abuse and violence, if such issues were to develop.
20.10. The Project will commit to sponsor and support community development programs in the Alpha community (and BRC), and will explore opportunity to do this in conjunction with other projects.
20.11. The Proponent will also give consideration to the on-going sponsorship of local community organisations, activities and groups.
20.12. The Proponent will monitor media coverage to gauge any change in regional profile.
20.13. The Proponent will develop a Code of Conduct to which all mine personnel will be required to adhere.
20.14. The Proponent will report on the monitoring program to the SIAU of DEEDI on an annual basis during construction.
20.15. The Proponent will report on the operational impacts of the Project to DEEDI's SIAU every three years, or as requested by the SIAU.

Proponent Commitment
20.16. The Proponent will agree to an external review of the SIMP when requested by the SIAU of DEEDI.
20.17. The Proponent and their construction contractors will develop management policies and processes to support the development and implementation of the Community and Stakeholder Engagement Plan. The Community Liaison role will be the principal contact between all stakeholders and the plan, and will be responsible for implementation and management of the Plan.
20.18. The Proponent will develop a dispute resolution mechanism within the Issues and Risks Registry which supports an active response to community and stakeholder concerns about social impact issues.
20.19. The Proponent will investigate opportunities to invite BRC representatives to participate in community development and consultation forums to enable the co-ordination of government and Project activities.
20.20. The Proponent will actively participate in any co-ordinated consultation committees or forums that bring the various projects together in a bid to minimise the potential for consultation fatigue within the council and community.
20.21. The Proponent will also endeavour to participate proactively in local and regional council planning processes and will establish a consultative committee to inform these processes and provide information required to support requests for funding and grants.
20.22. The Proponent will investigate partnership opportunities with local government in a bid to enhance its ability to identify, assign responsibilities and join forces when approaching the State for funding to, for example, ensure strategic regional development opportunities stemming from the development of the Galilee Basin are captured.
20.23. The Proponent will consider opportunities to develop personnel sharing programs and apprentice/trainee programs in consultation with local government.
20.24. The Proponent will implement a local recruitment and procurement policy. The SIMP will monitor procurement of local businesses and employment of local residents.
20.25. The Proponent will undertake on-going communication and provide continued support to landholders throughout the resettlement process.
20.26. The Proponent will provide personnel will a community and workplace induction.
20.27. The Proponent will establish an on-site medical facility.
20.28. The SIMP will identify means for monitoring demand on emergency services in Alpha and develop strategies to address emerging trends and identify additional resources when required. The Project will consult with local, state and private sector service providers to identify current service gaps and identify means of enhancing these services.
20.29. The Proponent will encourage personnel to undertake volunteering in the community, particularly those employees living within the local communities.
20.30. The Proponent will consider ways that it can support local child care facilities to obtain improved facilities including: • Supporting them to obtain additional funding; • Attracting new providers to the region; and • Supporting child care centres to train new staff or improve facilities.
20.31. Proponent will consult with local service providers and support BRC efforts to obtain more funding.
20.32. The Proponent will consider profiling agricultural labourers to determine if they align with the mine worker demographic and profile. The SIMP will identify monitoring tools to determine if there is a decrease in labour available for agriculture because of the Project, and will explore opportunity to do this in conjunction with other projects.
20.33. The Proponent will consider developing a spousal employment program.
20.34. The Proponent will consult with local landholders and provide information about transportation schedules and potential impacts of the Project's transportation, The SIMP will monitor the co-ordination of transportation between the Project and other potential projects in the region.
20.35. The SIMP will document responsibilities of all parties in delivering funding and services to the community.

Proponent Commitment
Appropriate monitoring to ensure this is happening will be developed.
20.36. In consultation with BRC the Proponent will determine the best route to the mine site from Alpha. The Proponent will undertake the necessary upgrade to this road between Alpha and the mine lease as required, and will explore opportunity to do this in conjunction with other projects. **20.37.** The Proponent will extend the road upgrade undertaken as part of the Alpha Coal Project to the mine site. The Proponent will also provide support to BRC and IRC with efforts to identify and obtain funding should they choose to try and extend the upgrade through to Clermont. The Proponent will also explore opportunities with BRC for alternative access routes to the Project site from Alpha.
20.38. The Proponent will discuss infrastructure opportunities for local economic and community development.
20.39. The Proponent will consider placing mobile phone receivers and towers in locations where they may also benefit the community. **20.40.** The Proponent will support BRC to extend these benefits as appropriate.
20.41. The Proponent will explore opportunities and partnerships through DEEDI and the Remote Area Planning and Development Board (RAPAD) to foster local business development.
20.42. The Proponent will ensure that BRC will be involved in discussions and in the development of strategies relating to housing options to ensure a range of options are considered for housing workers.
20.43. In consultation with stakeholders, policies, and programs intended to directly reduce potential skills drain from other industries, particular high priority sectors such as health, education and council services will be developed.
20.44. Consideration will also be given to developing a shift alignment that allows workers to continue to support the agricultural industry at key times.
20.45. HGPL is committed to assisting QPS secure required resourcing and has provided QPS with the Kevin's Corner program and ramp up schedule in order to better understand the ongoing policing requirements. HGPL will continue to consult with QPS on the project development and potential impacts to QPS. As part of the Community Safety and Wellbeing action plan, HGPL will support resource planning for emergency services via provision of information (e.g. employee numbers, work program) to ensure agency resourcing meets the needs of the local community and mine site. This information is to be kept updated as the project changes, and provided to emergency services regularly. Following assessment of requirements, mechanisms for securing funding and resourcing will be investigated.
20.46. The Cumulative Impact Assessment Report (SEIS Volume 2, Appendix O) will be progressively reviewed based on current conditions existing in the Galilee Basin, and HGPL will participate in processes that monitor and mitigate the cumulative social impacts in the Basin. **20.47.** HGPL is committed to the engagement process and participation in the proposed Galilee Basin Cumulative Social Impact Assessment Roundtable.
20.48. HGPL will participate with the Office of the Co-ordinator General, key stakeholders (local government and state agencies), and the Alpha Coal Project in the development of the terms of reference for the Galilee Basin Cumulative Social Impacts Assessment (CSIA) Study and Galilee Basin Social Infrastructure Plan through the Galilee Basin CSIA Roundtable
20.49. HGPL will participate in annual data collection conducted by OESR specifically the: • Resources Operations Employment Survey, and • Resources Project Employment Survey to provide current and future workforce and accommodation data for all employees and contractors engaged in construction, production and maintenance of the Kevin's Corner Project.
20.50. Future cumulative social impact mitigation and management measures identified through this Social Infrastructure Study and plan will be included in subsequent versions of the Kevin's Corner Coal Project SIMP.

C.21. Community Consultation

Proponent Commitment
21.1. The proposed social impact management strategies for the Project will include, but not be limited to: • Stakeholder Engagement Strategy, encompassing: – Kevin's Corner Consultative Committee (includes a focus on cumulative impact considerations) – Landholder Management Plan – Community Liaison Role • Local Economic Development Strategy, encompassing: – Indigenous Participation Plan – Local Employment Plan – Local Industry Participation Plan (LIPP) – Local and Regional Supply Chain Involvement Plan – Workforce Management Plan • Housing and Accommodation Management Plan, encompassing: – Camp Management Plan – Camp Resident Code of Conduct – Local Housing Strategy – Workforce Housing Strategy – Cumulative Impact considerations • Alpha Community Development Fund, with potential for: – Community Support and other Social Infrastructure contributions (including potential to address cumulative impacts) – Components of the Environmental Management Plan that will address key social impacts: ▪ Traffic Management Plan ▪ Community Safety and Health Plan ▪ Air Quality Management Plan.
21.2. HGPL is committed to the consultation process and will liaise with the Capricorn Conservation Council and other interested groups including environmental, conservation and agricultural community groups and organisations as the Project progresses. HGPL encourages other community organisations to register for more information on the project and request consultation meetings with HGPL in an ongoing manner.

C.22. Health and Safety

Proponent Commitment
22.1. Control measures to prevent the increase in local populations and spread of biting insect species of pest and health significance will be contained within a Pest (Human Health) Management Plan, to be implemented on an as-needs basis.
22.2. Measures to safeguard workers and local residents from the spread of communicable diseases will be developed.
22.3. The Proponent will develop a site specific Safety Management Plan for controlling the potential risks to the health and safety of the Project workforce to acceptable levels via validated engineered controls and well known and documented occupational health and safety management practices in accordance with relevant legislation and standards
22.4. The Proponent is committed to ongoing consultation and monitoring and review of trends with regards to cumulative impacts and identifying opportunities for improvement.
22.5. The Proponent liaised with State Emergency Services, Queensland Fire Rescue Services (QFRS) and local ambulance and hospital services to plan emergency response procedures discussed in Volume 1, Section 24.
22.6. HGPL will be in consultation with QPS to ensure that telecommunication systems can be upgraded or

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tailored for joint use where practicable.
22.7 Food served within the project site would be done in compliance with the Food Act 2006 to maintain appropriate hygiene levels.
22.8. The Health and Safety Management System would also address the following workforce health and safety related impacts: • security management to prevent unauthorised access to hazardous areas, restrict the use of equipment where appropriate training has not been obtained, and outline processes required for visitor access • pest management (human health), as requested by QH, to address the project's potential to generate and harbour disease vectors associated with pests that pose risk to human health mosquito management (with reference to QH's Guidelines to minimise mosquito and biting midge problems in new development areas as requested by QH

C.23. Economics

Proponent Commitment
23.1. The Proponent will set training targets that will include where practicable recruiting up to 10% of labour hours from apprentices and trainees and requiring contractors working on the Project to meet the same standard. In addition the Proponent will encourage and provide opportunities for up-skilling of employees.
23.2. The Proponent will develop a Local Industry Participation Plan consistent with the Queensland Government's Local Industry Policy.

C.24. Hazard and Risk

Proponent Commitment
24.1. A risk register will be implemented, maintained and periodically reviewed. The register will be used to assist in reviewing methods of work and develop risk management strategies and controls.
24.2. The Proponent is committed to comply with all legislative requirements. These include: • *Workplace Health and Safety Act 1995* (Qld); • *Workplace Health and Safety Regulation 2008* (Qld); • *Coal Mining Safety and Health Act 1999* (Qld); and • *Coal Mining Safety and Health Regulation 2001* (Qld).
24.3. Risk management will be used to identify hazards, assess risks and identify controls at various stages of the Project. The outcome of the risk management process will be the development of operational controls such as health and safety plans, safe operating procedures, inspections and audits based on the risks identified. Risks requiring controls will use a preferred order of control (hierarchy of control). Elimination will be the first control method to be considered.
24.4. The following will be canvassed when evaluating project risks: • Lessons from other Hancock and stakeholders and other projects; • Legislative requirements; • Industry standards; and • Lessons from industry. The risk management process will be applied from the planning stages throughout the life of the Project. The activities or events that trigger the risk assessment process include: • Design; • Prior to commencing day-to-day tasks; • Prior to the introduction of new items of plant, equipment or substance;

Proponent Commitment
• When there is a change in management systems, conditions, processes or plant; • After a significant incident; and • Periodic review.
24.5. Activity-based risk assessments, such as those completed by using JSEA tools, will be maintained and used to continuously improve the methods of work undertaken during the Project.
24.6. Employees of the Project will be involved in the development, implementation and review of safe operating procedures relating to risk management.
24.7. Training and competency will be developed to include: • Safe work method; and • Training and competency.
24.8. Principal Hazard Managements plans will be developed to include all high risk activities.
24.9. The Proponent will provide all resources, training and equipment for first response capability for all reasonably foreseeable incidents.
24.10. The Proponent will supplement the existing resources, capability and equipment of the rural fire brigade with site-based services.
24.11. HGPL confirm that all buildings will be built (where applicable) in accordance with Australian Standards and regulatory requirements including the requirements of the SPR 2009 assessable against the *Building Act 1975*. HGPL have agreed to consult with the QFRS to gain advice on the final design stages of the fire safety systems.
24.12. As agreed with the QFRS, HGPL will develop the Emergency Management and Response Plan (EMRP) (in compliance with the Coal Mine and Safety Act) prior to the commencement of construction works. The EMRP will be developed in collaboration with the QFRS, QPS, QAS and DoC, DES, and BRC. HGPL will implement the Emergency Management and Response Plan, in consultation with emergency services to ensure shared knowledge of key aspects including evacuation routes, emergency transfer plans, first aid facilities/supplies.
24.13. Ongoing consultation between HGPL and QAS will occur and will further discussions regarding QAS capabilities for provision of services, including the development of site specific safety plans and emergency plans. Site specific safety management plan and emergency plans will be developed in consultation with QAS and will be supplied to QAS Regional Management and will be done in conjunction with discussions with the Proponent.
24.14. The Proponent will explore options to enter into a direct contract with Queensland Ambulance Service for the provision of emergency services to the Project.
24.15. All fire fighting response equipment on site will meet Australian standards and accordingly will be compatible with QFRS equipment. HGPL has met with QFRS and will involve QFRS in the development of the EMRP. In addition HGPL has discussed the provision of Mutual Assistance and this will involve further discussions with QFRS regarding selection of appropriate equipment and design of fire systems to be installed within the mine site.
24.16 . HGPL has agreed to supply the required information (maps) to the Alpha Fire and Rescue Station.
24.17. The Project will have a dedicated response and rescue team on site due to the nature of the mining as well as dedicated medical services. Both these on-site emergency response teams are to be capable of providing immediate response. The Emergency Management and Response Plan will detail the response to emergencies and the synergistic relationship of the on-site teams with the QFRS, QPS and QAS as required.
24.18. Whilst it is recognised that a Flood Management Plan and a Storm response management plan are proposed mitigation strategies, the respective plans will be developed to address the potential exposure and associated hazards during the pre-operational phases of the project (i.e. during construction). The workers camp and the exit routes to the airport and road network will be designed to withstand the 1 in 100 year flood. HGPL has agreed with the Department of Community Safety to ensure the camp is prepared for flooding and any event that would cause the camps to be isolated, This will include the provision of supplies, water and appropriate evacuation procedures and protocols.
24.19. HGPL will liaise with the local disaster management groups and is committed to providing mutual assistance to the emergency services in the event of an incident on- or off-site.
24.20. The proposed airfield will be made available to rescue fixed wing aircraft and helicopter services for

Proponent Commitment
emergencies in the area
24.21. HGPL will provide notification to the ambulance communication centre of KC mine work related public road closures and works commencement dates, along with time frames associated for completion of each construction stage.
24.22. The Health and Safety Management System will be established and implemented to meet the requirements of the *Coal Mine Health and Safety Act 1999*, *Coal Mine Health and Safety Regulations 2001* for activities conducted on the mining lease and the *Work Health and Safety Management Act 2011* for those activities conducted off the mining lease.
24.23. The Health and Safety Management System will include all requirements for Principle Hazard Management plans as well as Standard Operating Procedures (SOP'S) and other systems. The requirements of the *Work Health and safety Management Act* for such plans and systems will also be met.
24.24. The Health and Safety Management System will include an Emergency Management and Response Plan which will be implemented and adequate resources provided to support this. This will also cover the requirements of both sets of legislation so only one Emergency Management and Response Plan is developed covering all mine activities to avoid any confusion.
24.25. The mine site will have an Emergency Management and Response Plan that is maintained up to date and is a controlled document. In addition to defining the manner in which on-site emergencies are to be managed, this plan will include the following information: • The nature of the emergency situations that could occur at the site; • The local public authorities involved (or potentially involved) with the management of emergencies that could arise at the site; • Emergency management structure; • Notification and escalation; • Mine site layout; • Specific Principle Hazard Management Plans (PHMP). E.g. Vehicles, explosives, fire, geotechnical instability; • Specific Emergency Response Procedures; and • Trigger Action Response Plans.
24.26. HGPL will develop an Emergency Management and Response Plan, including scenario planning with key stakeholders, to be implemented for the Project.
24.27. A Bushfire Management Plan will be prepared and implemented as part of the Health and Safety Management System prior to construction.
24.28. HGPL will continue to liaise with the QFRS on site emergency requirements including the development of a Bushfire Management Plan.
24.29. HGPL has agreed to work with QPS on the development of the Emergency Management and Response Plan. Concurrently, HGPL has agreed to QPS' request to provide a room with access to a telephone and internet on the mine site if police presence is required.
24.30. HGPL will implement an Emergency Management and Response Plan, in consultation with emergency services to ensure shared knowledge of key aspects including evacuation routes, emergency transfer plans, first-aid facilities/supplies.
24.31. HGPL will Collate a contact list of relevant local and regional emergency service agencies and personnel to facilitate delivery of this Action Plan. Investigate the establishment of a web-based, interactive system to support this database.
24.32 A dedicated Response and Rescue Team will be recruited to be based on-site due to the nature of mining (underground, confined space).
24.33 The Health and Safety Management System would also contain plans to address the following hazards and risks: • fire management (equipment, buildings or vehicle fires) • bushfire management • diesel/fuel/oil spill management

Proponent Commitment
• dangerous goods and explosives management • vehicle breakdown management • high wind management • storm response management • flood management • mine rescue.
24.34 Awareness of harmful species to humans, such as local dangerous snakes and spiders, will be promoted through the Staff Induction Program.
24.35 Site personnel will be required to wear appropriate personal protective equipment, use insect repellent and have access to first aid kits

C.25. Sustainability

Proponent Commitment
25.1. The Proponent is committed to ongoing consultation in accordance with a detailed Community and Stakeholder Engagement Plan to ensure local communities and stakeholders are engaged in a way that encourages active participation and safeguards the welfare of current and future generations.
25.2. The Project design and sequencing will enable progressive rehabilitation of the environment disturbed by the Project to comply with rehabilitation goals and objectives of the DERM guideline – Guideline 18: Rehabilitation requirements for mining projects in relation to intergenerational equity, polluter pays principle, protection of biodiversity and maintenance of essential ecologically processes.
25.3. The strategies for mine rehabilitation will involve progressive landform preparation and revegetation to create a stable post-mining landform and use consistent with the surrounding environment. A financial assurance is to be put aside to provide guarantee for long-term land use outcomes.
25.4. Community and stakeholder engagement will remain an integral component of the Project – e.g. accurate and timely environmental, social and economic information will be provided to surrounding communities and stakeholders to demonstrate compliance.

C.26. Decommissioning and Rehabilitation

Proponent Commitment
26.1. The post-mining landform will be constructed and rehabilitated to ensure that a similar proportion of land suitability classification as the pre-mining landscape is attained.
26.2. Where possible, rehabilitation planning will attempt to maximise opportunities for a diverse post-mining landscape and land-use. It is presently proposed that the final land-uses of the rehabilitated site will include a mixture of grazing and bushland. Creek diversions running around the site will have riparian areas rehabilitated to a pre-mining standard to include a diverse vegetative community of native trees, shrubs and grasses. Monitoring will be undertaken to track that objectives are being met.
26.3. The Proponent recognises the importance of appropriate Detailed site soil management plans will be developed prior to the commencement of mine construction. These will include a topsoil management plan (TMP) and an Erosion and Sediment Control Plan (ESCP). The TMP will specifically address topsoil stripping, stockpiling (includes specific locations), the development of topsoil inventories for the Project site, handling, re-spreading, amelioration and seedbed preparation.
26.4. Post-mining surveys of the rehabilitation will be undertaken across the site to determine whether the site

Proponent Commitment
meets success criteria and whether this result is being maintained over time. Once this occurs and the site is relinquished, the land will be returned to the relevant stakeholders and maintenance of the rehabilitation will no longer be required.
26.5. A specific Infrastructure decommissioning and closure program will be developed and implemented, and will occur to meet legislative and EA conditions. The plan will include: • Decommissioning of infrastructure, plant and buildings – Site preparation – Site services – Infrastructure and buildings – Contaminated land assessment • Bulk earthworks and rehabilitation – Infrastructure, plant and buildings – Hardstand and haul roads – Dam and surface water features
26.6. At closure, a preliminary sampling and analysis program (Phase 1) will be implemented to determine whether an assessment (Phase 2 – detailed investigation of contamination involving drilling, etc.) should be conducted to quantify the amount of contaminated material that may need to be bio-remediated on site.
26.7. Post-closure, a water monitoring program will need to remain in place to closely monitor any changes to chemistry within the voids.
26.8. To ensure the safety of the final void, the surrounding final slopes will be left in a condition where the risk of slope failure is minimised, for the low wall and high wall. A number of measures will be implemented and the geotechnical stability assessed. Prior to closure, further investigations will be undertaken to confirm the criteria above and appropriate action will be taken to ensure effective long term safety, stability and management of the void.
26.9. Final void management will include: • Spontaneous combustion • Surface water • Safety; and • Final void use
26.10. Following closure of the mine the existing environmental monitoring program will be maintained until all decommissioning and rehabilitation works have been completed. Notwithstanding this, there may be the need to establish some additional monitoring sites depending on the nature of the decommissioning works and also in response to finding possible sources of pollutants to the environment. The type and location of this monitoring will be determined further during the decommissioning phase of the mine site.
26.11. The Rehabilitation Management Plan will be a live document allowing for continuous improvement that will benefit from the implementation of rehabilitation monitoring and trials once the site has commenced mining operations. The implementation of a staged rehabilitation plan that focuses on restoring structurally complex habitat will ensure in the long term that impacts from aggressive fauna species will be minimised.
26.12. The objectives of rehabilitating disturbed land include: • progressively undertake rehabilitation on areas that cease to be used for mining or mine-related activities within two years of becoming available. • achievement of acceptable post-disturbance land use suitability – mining and rehabilitation will aim to create a stable landform with land use capability and/or suitability similar to that prior to disturbance, unless other beneficial land uses are pre-determined and agreed. That is the land will be rehabilitated to a condition that will sustain low density grazing land and native bushland, unless otherwise agreed with relevant stakeholders. This will be achieved by setting clear rehabilitation success criteria and outlining the monitoring requirements that assess whether or not these criteria are being accomplished. • post-disturbance grazing land will be rehabilitated to a land suitability Class 3, which has moderate limitations, and Good Quality Agricultural Land Class C2 and C3 Pasture Land. The objective of the post-disturbance grazing land is to accomplish and remain as sustainable low density cattle grazing.

Proponent Commitment
• native vegetation will be revegetated using existing vegetation communities where appropriate, for example Brigalow Open Woodland, Silver-leaved Ironbark Open Woodland, Poplar Box Open Woodland, Gidgee Open Woodland or other appropriate vegetation communities identified at the Project Site during the pre-mining assessment. The objective of the rehabilitation for the post-disturbance land use of native vegetation is to accomplish and remain a sustainable native bushland. • creation of stable post-disturbance landform - mine wastes and disturbed land will be rehabilitated to a condition that is self-sustaining, or to a condition where maintenance requirements are consistent with an agreed post-mining land use. • preservation of downstream water quality – surface and ground waters that leave the mining leases should not be degraded to a significant extent. Current and future water quality will be maintained at levels that are acceptable for users downstream of the site.
26.13. As per current industry practice, success criteria and rehabilitation methods will be regularly assessed and updated based on a "continuous loop of improvement" with respect to future rehabilitation strategies and relinquishment. During operations rehabilitation works will be designed specifically to optimise the potential for rapid ecosystem re-establishment.
26.14. Success criteria will be developed for the rehabilitation of remnant regional ecosystems and other pre-disturbance land use types and approved for mine rehabilitation prior to mining activities commencing.
26.15. The success criteria will be reviewed every 3 to 5 years with stakeholder participation to ensure the criteria remain realistic and achievable.
26.16. Future soils testing will be undertaken to determine if the soil quality objectives are achievable, though confirming current soil properties.
26.17. In areas where less active bank erosion develops, large woody debris will be placed in-stream to encourage the deposition of sediment and revegetation over time.
26.18. A targeted revegetation will be undertaken in areas where surface water patterns have been affected.
26.19. Any creek crossings (i.e. culverts, etc) will be removed and the pre-existing drainage line re-instated where applicable. If required the area will be deep ripped to loosen compacted material.
26.20. A light vehicle access road is to be maintained to enable inspections of the site during closure of the mine.
26.21. Fertiliser and pasture/tree seed will be applied to assist establish pasture post-mine land use.
26.22. A ground and surface water monitoring program will remain in place to closely monitor any changes to water chemistry within the site boundary.
26.23. During operations rehabilitation works will be designed specifically to optimise the potential for rapid ecosystem re-establishment. It is in the Proponents interest to successfully rehabilitate the available areas of the mine to reduce their financial assurance exposure. As part of the continued development of the site's rehabilitation criteria measurable and/or definitive goals will be set.
26.24. Erosion controls will be put in place to prevent top soil leaving the site.
26.25. Native tree and shrub establishment on-site will be dominated by the direct seeding method, currently being used at the majority of coal mines located to the east of the Galilee Basin. Revegetation will be achieved by using species from the local plant communities that were identified during the flora assessment undertaken in 2010 (see EIS Volume 1, Section 9), taking into account seed availability and seasonal suitability.
26.26. The timing and methodology and success criteria for the rehabilitation of the disturbed areas of the mine will be contained within the site Rehabilitation Management Plan and reflected in the site Plan of Operations (PoO).
26.27. Aerial sowing and ground broadcasting will be conducted for both tree and pasture seed as the preferred sowing methods and grazing will be restricted whilst the vegetation is establishing.
26.28. All revegetated areas will be monitored to ensure long-term groundcover establishment and success. Revegetation techniques will be continually developed and refined over the life of mine through an ongoing process of monitoring at the site and recognition of other industry experiences.

Proponent Commitment
26.29. Amelioration of cracks and transport of rock and soil will be undertaken with small machinery to avoid further impacts to remnant vegetation where possible. If some trees have to be cleared to allow amelioration these should be counted as among the dead trees. Cleared trees should be immediately replaced 3:1 with the same species (unless that species is showing susceptibility to subsidence impacts then another common species for the impacted RE can be used). All dead tree material should be left on site and used in rehabilitation as habitat.
26.30. A program of revegetation using native species found in the effected REs will be undertaken in areas experiencing more than 5% tree deaths. Areas affected by ponding should be rehabilitated with species from neighbouring riparian communities.

C.27. Social Impact Management Plan

Proponent Commitment
27.0 HGPL commits to implementing the Social Impact Management Plan April 2013 and all the commitments contained therein.

C.28. Off-Lease Assessment

Proponent Commitment
28.1. HGPL will continue to liaise with the landholder to determine adequate compensation for loss of land area.
28.2. To ameliorate any potential impacts to the landholder, the Proponent will reinstate any damage to on-farm infrastructure and utilise the mitigation measures proposed in Section 6.5 of the Kevin's Corner EIS (HGPL 2011).
28.3. Operational techniques contained within the EIS EMP (see EIS Volume 2, Appendix W) will be included in an Environmental Management Plan (EMP) for off lease infrastructure to mitigate potential amenity impacts at sensitive receptors in the vicinity of the off lease road and rail spur.
28.4. The potential for fragmentation and segregation will require one or more stock crossings to allow for the movement of stock in and out of each of these created land parcels. To ensure the proposed infrastructure does not detrimentally impact Surbiton South farm operations, consultation between the land holder and rail manager will be required to allow for stock movement across the rail infrastructure. In addition: • Land use management techniques within the EMP will sufficiently ameliorate impacts to agricultural values of the subject lands; • Stock crossings over/under proposed infrastructure to facilitate stock movement; and Ongoing land holder consultation to discuss farm management techniques before, during and after construction of the infrastructure and for during operation of the proposed infrastructure.
28.5. To ameliorate the impacts to land suitability during construction the following measures will be employed: • Erosion controls will be constructed where necessary; • As soon as practicable, after completion of construction activities, the construction area will be progressively rehabilitated to match the surrounding landform; • Stockpiled topsoil will be distributed across the rehabilitated area and, in consultation with the landholder, any cleared vegetation placed across it to assist in soil retention and provision of feed stock for cattle (where appropriate); and • Revegetation will use appropriate species for the subject site (i.e. crops/pasture or Indigenous native species).
28.6. No additional water courses have been identified in the vicinity of the proposed off lease rail or road alignment; should any be found, appropriate investigation and management measures (such as flood controls) would be adopted.

Proponent Commitment
28.7. The EM Plan developed for the constructions and operation of the off lease road and rail will include strategies in the event that indigenous or non-indigenous cultural artefacts are identified onsite.

C.29. Subsidence

Proponent Commitment
29.1. An annual report will be prepared following the commencement of underground mining activities which details mining activities and all monitoring and rehabilitation activities undertaken with the Subsidence Management Plan.
29.2. As the full impacts of subsidence will gradually become apparent, mitigation measures will be developed in detail following post-subsidence vegetation surveys which will characterise changes to landform and vegetation communities.
29.3. Subsidence is predicted to result in impacts to selected patches of vegetation within the area to be mined (Figure 10-5). An offset Plan has been developed to address the impacts of subsidence. The existing Kevin's Corner Offset Plan will be updated to reflect this change (as well as future impacts identified through post-subsidence monitoring). The vegetation monitoring program will include: • Establishment of reference sites matching the REs potentially impacted; – Reference sites should be the equivalent to the best condition polygon of the RE on site; – Reference sites and subsidence monitoring sites will be of equivalent size (suggested 500 m^2 to 1000 m^2); • Establishing monitoring sites; – Reference sites and subsidence monitoring sites will be of equivalent size (suggested 500 m^2 to 1000 m^2); – Monitoring site should be permanently established and includes areas overlying pillars, centre of the longwalls and over the edges of the pillars; • Undertake pre-subsidence vegetation condition evaluations within areas potentially impacted; – Information will be collected on any differences in condition between the established monitoring sites and the reference sites before subsidence; • Observational Monitoring of reference sites and affected communities. Parameters to be recorded include; – foliar discolouration; – partial defoliation; – increased pathogenic attack; or – tree death; • Percentage of deaths will be determined within the monitored sites then expanded outwards over a larger area and measured as the number of dead trees per 100 trees. The extent of tree death will be mapped as areas with > 10% tree death (10 deaths in 100 trees) as areas requiring offsetting. Areas mapped as > 5% tree deaths will undergo rehabilitation; • Include photo monitoring; and • Review monitoring reports of erosion, water quality, rehabilitation and subsidence for indications of possible impacts
29.4. The methodology for remediating cracking and other potentially negative impacts caused by subsidence of the surface by underground mining will be determined through an active monitoring program. The Subsidence Management Plan outlines a number of methods that will be considered in managing the cracking impacts and the timing of intervention. These cracks will be remediated following three storm events if they are not self-sealed by this time.
29.5. HGPL propose to offset up-front the unavoidable direct impacts from the Project (such as clearing for open-cut pits and associated infrastructure) and the predicted life of mine residual impact from subsidence on those biodiversity values specified under each offset policy. Offsets will then be checked against planned in five yearly intervals over the course of the life of mine, with reconciliation of actual impacts from the previous five years being reported and an estimate of impacts for the next 5 years. This will ensure an adaptive approach is taken with

Proponent Commitment
sufficient offsets in place at all times.
29.6. HGPL proposes that a comprehensive monitoring program of subsidence and an assessment of the success of mitigation measures be implemented over the 30 year period during underground mining. Subsidence impacts will be modelled in five year stages and results of monitoring will also be reported at the end of each five year period to document what has actually occurred, and if the modelled extent of impacts was accurate.
29.7. The Proponent will liaise with Queensland Parks and Wildlife Service on appropriate subsidence mitigation measures to be implemented within the Cudmore Resources Reserve.
29.8. A subsidence monitoring program will be developed and implemented.
29.9. Baseline condition monitoring of all watercourses likely to be impacted through subsidence will be undertaken prior to mining in accordance with the Index of Diversion Condition developed as a result of the Australian Coal Association Research Program (ACARP) Project C9068. Baseline monitoring will be supported by: • Airborne LIDAR survey (accuracy ± 0.1 m); • Dry season vertical aerial photography; and • Helicopter-acquired high definition digital video of all major streamlines. Reference watercourse and floodplain reaches of at least 300 m will be documented upstream, within, and downstream of the potentially affected areas. Data gathered will include ground surveyed cross sections, bedforms (pools/riffles/runs/sand sheets/bedrock controls), entry points of other watercourses and localised tributaries, and existing bed and bank scour points. **29.10.** The Baseline Monitoring Program described in section 9.2.1 of SEIS Appendix N Interim Subsidence Management Plan will be repeated at 5 yearly intervals throughout the mine life.
29.11. The Subsidence Management Plan (SMP) will be reviewed and updated on an annual basis.
29.6. Detailed surveys will be undertaken of potential subsidence-impacted reaches both prior to and following subsidence.
29.6. A number of pre-subsidence measures will be implemented within the bed and banks of watercourses to minimise the potential for adverse subsidence impacts to arise.
29.7. Subsidence monitoring will be undertaken on all watercourses likely to be impacted through subsidence pre and post-subsidence to assess the impacts of subsidence on geomorphology, groundwater and vegetation. Pre-subsidence monitoring of the proposed subsidence areas will be undertaken to ensure that any subsidence impacts are quickly identified and appropriate mitigation applied.
29.8. Post-subsidence surveys will be carried out surrounding all pillar zones intersecting each watercourse or tributary. Post-subsidence surveys will record the following: • Erosion or deposition processes that have occurred as a result of subsidence; • Migration of head cut erosion within watercourses and tributaries; • Localised changes to stream bed slope; • Localised widening of channels; • Destabilisation of stream bed and banks including fracturing and incision; • Localised changes to bank heights; and • Size of subsidence void created within the watercourse.
29.9. Post-subsidence surveys will be undertaken in the following intervals: • Within 2 months of initial subsidence; • Following rainfall event of 1 in 2 ARI for the duration equal to the time of concentration for the catchment at the location of the subsidence as measured by stream gauging station; • Following a peak flow event of greater than a 1 in 2 ARI as measured by a stream gauging station; and • Annually
29.10. Post-subsidence surveys will be supplemented by detailed geomorphic assessments which will be undertaken on a five yearly basis throughout the mine life and will report on the nature and extent of geomorphic changes
29.11. In the event that post-subsidence surveys indicate that additional works are required, the following

Proponent Commitment
measures will be considered: • Replace sand across the channel bed, including higher sand deposits suitable for re-creation of in-channel benches. • In areas where less active bank erosion develops, large woody debris will be placed in-stream to encourage the deposition of sediment and revegetation over time. • Targeted revegetation will be undertaken in areas where surface water patterns have been affected. • Ripping and seeding of cracks. This will be supplemented with grouting where required. • Regrading and backfilling with mine spoil to minimise erosion and sedimentation.
29.12. Post-subsidence groundwater monitoring will comprise of the following: • Quarterly water level measurements; • Field conductivity measurements on a six monthly basis; • Annual collection of groundwater samples for full chemical analysis.
29.13. Subsidence impacts will be managed in accordance with the Subsidence Management Plan.
29.14. Rehabilitation of riparian banks and floodplains (following diversion or subsidence) will include riparian species as discussed in the EMP. There will also be an increased focus on habitat creation around watercourse diversions and riverine areas impacted by subsidence.
29.15. To ensure subsided land is suitable for grazing, initial repair works will be undertaken where required after at least three months behind the advancing face of the longwall. Repair works will focus on any surface disturbances such as existing highly eroded access tracks and erosion gullies that will concentrate the flow of water and increase erosion associated with subsidence cracking.
29.16. A post-subsidence drain and waterway monitoring program (part of the SMP) will be implemented and surface cracks within drains and waterways that have not naturally filled after approximately three storm events will be sealed with clay. The rehabilitation of the subsidence cracks will include as appropriate: • Carrying out inspections over subsided areas and locating surface cracking. • Undertaking minimal clearing, if required, of areas around cracks to allow for ripping and seeding.
29.17. HGPL to fund, install and maintain stock exclusion fencing required to exclude stock from banks whilst these areas are subject to subsidence impacts.
29.18. General rehabilitation of the subsided riparian subsidence areas will involve the following key design and planning factors: • Provide a cover of topsoil in a weathered rock matrix to create a stable substrate for revegetation of channel banks. Weathered rock provides temporary erosion protection by covering erodible soils and minimising topsoil loss. • Replace sand across the channel bed, including higher sand deposits suitable for re-creation of in-channel benches. • Install timber groynes/pile field retards at the base of the channel banks (extending into the channel) to mitigate erosion undercutting the channel banks and to facilitate creation of in-channel benches. The structures will be built between each of the subsided panels affecting the river before subsidence occurs. • In areas where less active bank erosion develops, large woody debris will be placed in-stream to encourage the deposition of sediment and revegetation over time. • Design local drainage works to prevent the uncontrolled flow of runoff from the subsided floodplain area over the channel banks. Small diversion bunds directing floodplain runoff to properly engineered rock chute structures will be installed to minimise bank erosion. • Topsoiling and revegetation on banks. Stock will be excluded to a width of at least 30 metres from the top of bank and subsided floodplain areas in order to minimise further impacts on vegetation cover and land condition. • A targeted revegetation will be undertaken in areas where surface water patterns have been affected.
29.19. Where required, stock will be excluded from subsided and rehabilitated areas, including riparian areas, to prevent injury to animals and to increase grass cover and seed store. This will be achieved through the erection of fences in consultation with the relevant landholder(s). Where required, people will also be excluded and appropriate signage warning of the potential hazards due to subsidence will be erected.
29.20. The rehabilitation undertaken on subsided areas will be monitored annually. Where the regeneration of dominant species disturbed by remediation works does not occur within one year, additional vegetation will be seeded or planted as required.

Proponent Commitment
29.21. Areas where there is the potential for increased inflow to cause operational issues through crack development will be treated with ripping and seeding in accordance with accepted practice. This will be supplemented with grouting where required to minimise the potential for surface inflows into the mine workings.
29.22. Subsided areas within creek channels will be actively monitored for crack development and cracks will be grouted where they have persisted beyond three storm events or have led to increased inflows into the mine workings.
29.23. Significant ponded areas will be drained by excavation of the area above the downstream pillar to allow the area to drain into natural drainage lines on completion of each longwall panel. Areas of predicted permanent ponding along watercourses will be drained where appropriate by excavating the areas overlying the pillar structure to allow natural stream flow.
29.24. Ripping and seeding of areas where required. Following initial ripping and seeding, if trees are to be planted, they will not be planted until enough rain has fallen. If ripping is not feasible due to the width of the cracks, topsoil will be stripped and stockpiled. Clay material will be imported to fill and seal cracks and the topsoil will be respread once the cracks have sealed. The area will then be reseeded with appropriate plant species.
29.25. Stock will be excluded to a width of at least 30 metres from the top of bank and subsided floodplain areas in order to minimise further impacts on vegetation cover and land condition.
29.26. Minor dozer reshaping work will be undertaken to ensure surface level consistency with the surrounding areas.
29.27. Where significant cracks do not self-seal within three storm events or if there is potential for surface flows to enter the mine workings, active mitigation which may include deep ripping, seeding and grouting will be undertaken. Inspections will be conducted over subsided areas in order to identify these locations. If the cracks are too wide, clay or sand will be imported to fill the cracks and the area will be spread with topsoil and seeded.

C.30. Cudmore Resources Reserve

Proponent Commitment
30.1. The Proponent will seek a Lease beneath the *Land Act 1994* for the life of the mine for an interest in the Cudmore Resources Reserve. This lease will apply to lands subject to the extent of the MLA that are identified to be within the boundaries of Cudmore Resources Reserve.
30.2. The Proponent will prepare a specific management plan for Cudmore Resources Reserve that will detail amongst other things and exhibit the following: • The need and purpose of the plan; • The establishment and obligations of the trustees; • The biophysical, cultural and resource values; • The management constraints, considerations and parameters required; • The management framework and contextual fit; and • An actual construction and operation plan.
30.3. The CRROP is to be developed in consultation with NPRSR prior to construction.
30.4. The CRROP will detail management of operations within the CRR to minimise impacts from surface cracking, erosion, sedimentation, ponding and on aquatic ecology.
30.5. HGPL will ensure that the stock route diversion planned along the lease boundary with Cudmore Resources Reserve will be contained wholly within the Mining Lease area at all times.
30.6. HGPL will develop the Cudmore Resources Reserve Operations Plan (CRROP) in accordance with Cudmore Resources Reserve Management plan and the outline provided in Appendix T3 of the SEIS – Scope for the Cudmore Resources Reserve Operations Plan prior to any construction of operations within the Resource Reserve.
30.7. The Operations Plan will be prepared by the Proponent and will deal specifically with those activities proposed to occur within and beneath Cudmore Resources Reserve. This plan will detail:

• The ecological and cultural values of the area of Cudmore Resources Reserve subject to ML 70425; • The mining and associated activities which are proposed to occur within the area of Cudmore Resources Reserve subject to ML 70425; • The likely impacts to the identified ecological and cultural values which may be caused by the proposed mining and associated activities within the area of Cudmore Resources Reserve subject to ML 70425; • Environmental objectives and commitments for the area of Cudmore Resources Reserve subject to ML 70425; and • Control strategies and indicators to measure and ensure environmental objectives and commitments are being achieved.
30.8. Low impact crack remediation measures will be implemented within the Cudmore Resources Reserve .
30.9. Cudmore Resources Reserve Operations Plan to be updated to include Fire Safety and Workplace Health & Safety procedures prior to construction.
30.10. HGPL will implement a sufficient buffer within the boundary of the ML and Cudmore Resources Reserve to ensure that no off lease subsidence occurs within the Cudmore National Park.
30.11. HGPL will select sites for any infrastructure required to be installed within the Cudmore Reserve which are to have minimal impacts on vegetation as far as practicable.
30.12. HGPL will consult with the Department of National Parks, Recreation, Sport and Racing (NPRSR) prior to mitigation works which require vegetation removal within the Cudmore Reserve.
30.13. HGPL will identify 10 Reference sites within the Cudmore Resource Reserve and Cudmore National Park, six within the Resource Reserve and four within the National Park. These reference sites will also be used to document the baseline site conditions during the Ecological Equivalence surveys scheduled for March – May 2014.
30.14. Reference sites will be monitored every five years until such time that mining works commence within the Cudmore Resource Reserve and then annually prior to and during mining.
30.15. Subsidence monitoring will occur over all subsided areas which include the areas of the ML within the Cudmore Resource Reserve.

Acronyms and abbreviations

Acronym	Definition
µS/cm	microsiemens per centimetre
AADT	annual average daily trips
ACARP	Australian Coal Association Research Program
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
AEP	annual exceedance probability
AMD	acid metalliferous drainage
AMP	Archaeological Management Plan
ANZECC	Australian and New Zealand Environment Conservation Council
ARI	average recurrence interval
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
AS/NZS	Australian Standard/New Zealand Standard
BBIPP	Bowen Basin Indigenous Participation Partnership
BIBO	bus-in-bus-out
BPA	biodiversity planning assessment
BRC	Barcaldine Regional Council
CAMBA	China–Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
CDMP	coal dust management plan
CEMP	construction environment management plan
CHMP	cultural heritage management plan
CHPP	coal handling and preparation plant
CHRC	Central Highlands Regional Council
CID	community infrastructure designation
CLR	Contaminated Land Register
CNP	Cudmore National Park
CO_2-e	carbon dioxide equivalent
COAG	Council of Australian Governments
CRR	Cudmore Resources Reserve
CSG	coal seam gas
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DATSIMA	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
dB(A)	decibels measured at the ‘A’ frequency weighting network
DEEDI	The former Department of Employment, Economic Development and Innovation
DEHP	Department of Environment and Heritage Protection
DERM	The former Department of Environment and Resource Management
DETE	Department of Education, Training and Employment
DIDO	drive-in-drive-out

Acronym	Definition
DNPRSR	Department of National Parks, Recreation, Sport and Racing
DNRM	Department of Natural Resources and Mines
DSA	design storage allowance
DSDIP	Department of State Development, Infrastructure and Planning
DSITIA	Department of Science, Information Technology, Innovation and the Arts
DTMR	Department of Transport and Main Roads (Qld)
EA	environmental authority
EC	electrical conductivity
EE	ecological equivalence
EIS	environmental impact statement
EMP	environmental management plan
EMR	Environmental Management Register
EPA	Environmental Protection Agency
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP	Environmental Protection Policy (water, air, waste, noise)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
ERA	environmentally relevant activity
FIFO	fly-in fly-out
GAB	Great Artesian Basin
GABWRA	Great Artesian Basin Water Resources Assessment
GARIO	Guidelines for Assessment of Road Impacts of Development
GBOS	Galilee Basin Offset Strategy
GHG	greenhouse gas
GQAL	good quality agricultural land
HGPL	Hancock Galilee Pty Ltd
IAS	initial advice statement
ICH	Indigenous cultural heritage
IECA	International Erosion Control Association
IESC	Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
ILUA	Indigenous Land Use Agreement
IRC	Isaac Regional Council
ISMP	Interim Subsidence Management Plan
ISO	International Organisation for Standardisation
IWMP	Interim Waste Management Plan
LOM	life of mine
LP Act	*Land Protection (Pest and Stock Route) Management Act 2002*
mg/L	milligrams per litre of liquid/gaseous liquid

Acronym	Definition
MISC	Mining Industry Skills Centre
ML	megalitres
MLA	mining lease application
MNES	matters of national environmental significance
MOU	memorandum of understanding
MRA	*Mineral Resources Act 1989* (Qld)
MRL	mandatory reporting level
Mt	Megatonnes
mtpa	million tons per annum
MWD	mine water dam
NAF	non-acid forming
NC Act	*Nature Conservation Act 1992* (Qld)
NGER Act	*National Greenhouse and Energy Reporting Act 2008* (Cwlth)
NICH	non-Indigenous cultural heritage
NPA	National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development
OEMP	operational environmental management plan
PAF	potentially acid forming
PM_{10}	particulate matter with equivalent aerodynamic diameter less than 10μm
$PM_{2.5}$	particulate matter with equivalent aerodynamic diameter less than 2.5μm
PMAV	property map assessable vegetation
QAS	Queensland Ambulance Service
QFRS	Queensland Fire and Rescue Service
QH	Queensland Health
QH Act	*Queensland Heritage Act 1992* (Qld)
QPS	Queensland Police Service
QR	Queensland rail
QWQG	*Queensland Water Quality Guidelines*
RE	regional ecosystem
REMP	receiving environment monitoring program
RIA	road impact assessment
RMP	rehabilitation management plan
ROM	run-of-mine
RTN	right to negotiate
RUMP	road-use management plan
RWBM	regional water balance model
SCL	strategic cropping land
SDA	state development area
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
SDWPO Regulation	State Development and Public Works Organisation Regulation (Qld)

Acronym	Definition
SEIS	supplementary environmental impact statement
SEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SIA	social impact assessment
SIMP	social impact management plan
SLA	statistical local area
SMP	species management plan
SPA	*Sustainable Planning Act 2009* (Qld)
SSBV	state significant biodiversity values
STP	sewage treatment plant
TEC	threatened ecological community
TDS	total dissolved solids
TMP	traffic management plan
TOR	terms of reference
TSP	total suspended particles
VM Act	*Vegetation Management Act 1999* (Qld)
VSC	valued social components
WEEE	waste electrical and electronic equipment
WHS Act	*Workplace Health and Safety Act 2011* (Qld)

Glossary

Term	Definition
assessment manager	For an application for a development approval, means the assessment manager under the *Sustainable Planning Act 2009* (Qld).
bilateral agreement	The agreement between the Australian and Queensland governments that accredits the State of Queensland's EIS process. It allows the Commonwealth Environment Minister to rely on specified environmental impact assessment processes of the state of Queensland in assessing actions under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).
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 *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).
controlling provision	The matters of national environmental significance, under the *Environment Protection and Biodiversity Conservation Act 1999* (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 'significant projects'.
Coordinator-General	The corporation sole constituted under section 8A of the *State Development and Public Works Organisation Act 1938* 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 d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
environmental effects	Defined in Schedule 2 of the SDPWO Act as the effects of development on the environment, whether beneficial or detrimental.
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 *Environmental Protection Act 1994* (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)	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: • 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 • possible measures to mitigate adverse effects.
matters of national environmental significance	The matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act 1999*. The eight matters are: 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 h) nuclear actions (including uranium mines).
nominated entity (for an imposed condition for undertaking a project)	An entity nominated for the condition, under section 54B(3) of the SDPWO Act.
properly made submission (for an EIS or a proposed change to a project)	Defined under section 24 of the SDPWO Act as a submission that: a) is made to the Coordinator-General in writing b) is received on or before the last day of the submission period c) is signed by each person who made the submission d) states the name and address of each person who made the submission e) states the grounds of the submission and the facts and circumstances relied on in support of the grounds.
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.
Significant project	A project declared (prior to 21 December 2012) as a 'significant project' under section 26 of the SDPWO Act. Projects declared after 21 December 2012 are referred to as ‘coordinated projects’.

stated condition	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: • development approval under the *Sustainable Planning Act 2009* • proposed mining lease under the *Mineral Resources Act 1989* • draft environmental authority (mining lease) under Chapter 5 of the *Environmental Protection Act 1994* (EPA) • proposed petroleum lease, pipeline licence or petroleum facility licence under the *Petroleum and Gas (Production and Safety) Act 2004* • non-code compliant environmental authority (petroleum activities) under Chapter 4A of the EPA.
works	Defined under the SDPWO Act as the whole and every part of any work, project, service, utility, undertaking or function that: a) 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 b) 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 c) 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.

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