

Contents

EXECUTIVE SUMMARY	1
1 Introduction	1
1.1 BMA Bowen Basin Growth Project	1
1.2 Caval Ridge Project	3
2 Project Overview	5
3 The Proponent	6
4 Project Need and Alternatives	6
4.1 Project Need	6
4.2 Project Alternatives	7
5 Stakeholders and Consultation	8
6 Approval Process	8
7 Environmental Management	9
7.1 Land Resources	9
7.2 Scenic Values	10
7.3 Mineral Waste	11
7.4 Surface Water	11
7.5 Groundwater	12
7.6 Project Site Ecology	13
7.6.1 Terrestrial Flora	13
7.6.1.1 Regional Ecosystems	13
7.6.1.2 Terrestrial Flora Species	14
7.6.1.3 Declared Weed Species	15
7.6.2 Terrestrial Fauna	15
7.6.3 Aquatic Fauna and Flora	16
7.7 Air Quality	16
7.8 Greenhouse Gases	17
7.9 Noise and Vibration	19
7.10 Traffic	20
7.11 Waste Management	21
7.12 Native Title and Cultural Heritage	21
7.12.1 Indigenous Cultural Heritage	21
7.12.2 Non Indigenous Cultural Heritage	22
7.13 Social Aspects	22
7.14 Economics	23
7.15 Health and Safety	24
7.16 Environmental Management and Monitoring	25
7.17 Cumulative Impacts	25
8 Conclusion	30

EXECUTIVE SUMMARY

1 Introduction

1.1 BMA Bowen Basin Growth Project

Billiton Mitsubishi Alliance Coal Operations Pty Ltd (BMA) has identified quality coal reserves associated with the various projects that make up the BMA BBCGP. The BMA BBCGP involves the growth of BMA's coal mining operations in the northern section of the Bowen Basin, near Moranbah, Queensland. Specifically, the BMA BBCGP includes mining development at Daunia, Caval Ridge and Goonyella Riverside, and the development of a new, larger capacity airport in the vicinity of Moranbah to accommodate increased travel to and from the area. The BMA BBCGP Initial Advice Statement outlined that the production of an additional 21.5 Mtpa of coal products through the development of two new coal mining operations, and expansion of an existing operation. The Caval Ridge Mine and the Daunia Mine will be new operations whilst the expansion will be of the operating Goonyella Riverside Mine and the development of associated mine infrastructure for each of these operations (Figure 1).

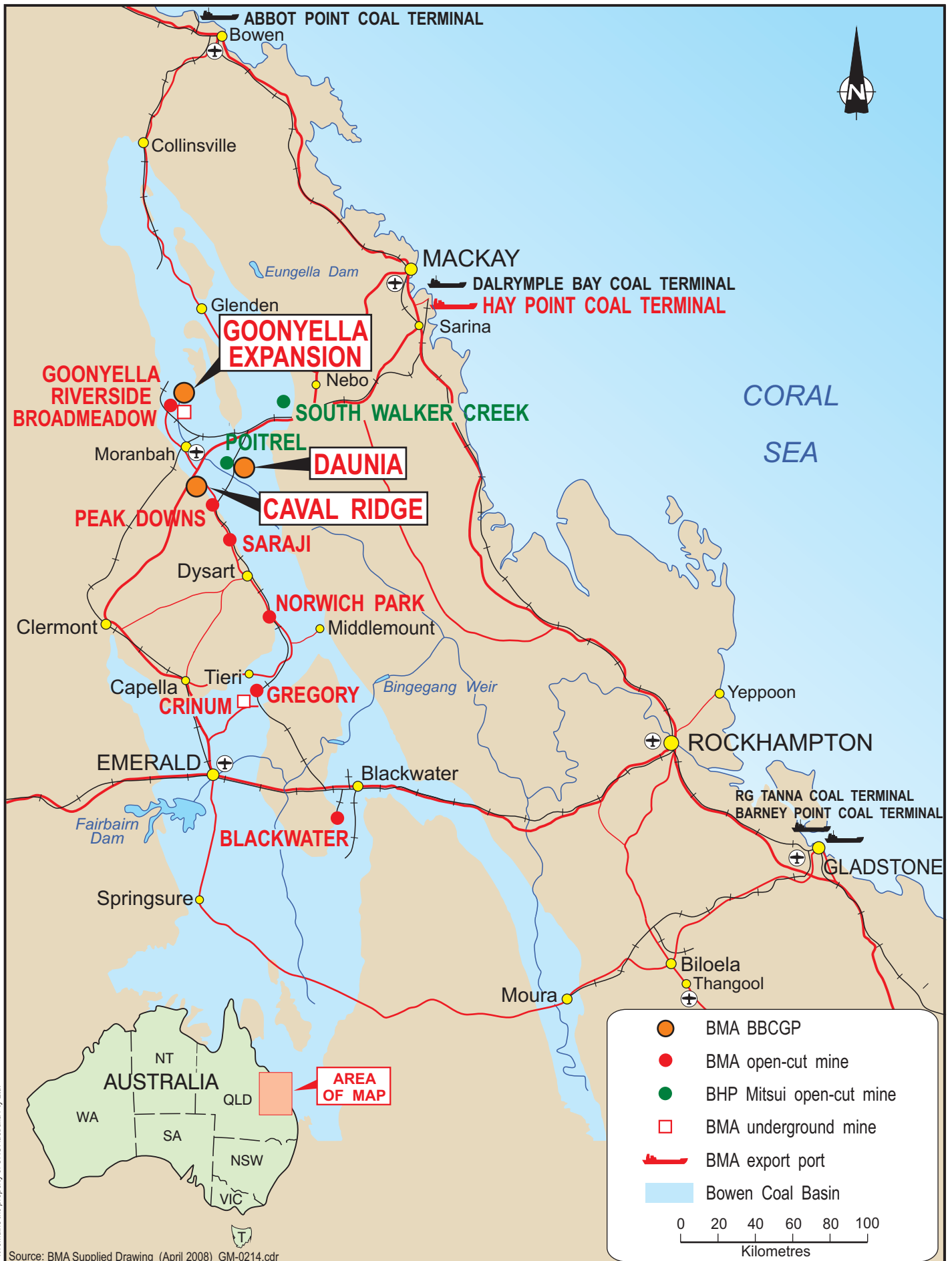
This EIS is the second of 4 projects that comprise the BMA BBCGP, following on from the EIS for the Daunia Coal Mine which was publicly advertised commencing in November 2008. The EISs prepared for the remaining 2 projects will continue to examine and report on these local and regional benefits, impacts and mitigation measures.

The key elements of the BMA BBCGP are summarised in Table 1.

Table 1 Key Elements of the BMA BBCGP

Project Element	Tonnage Contribution (Mtpa)	Construction Commencement	First Coal Produced	Workforce	
				Construction	Operation
Daunia Mine	4	2009	2010	450	300
Caval Ridge Mine	8	2010	2013	1,200	495
Goonyella Riverside Mine Expansion	9.5*	2010/2011	2013	900	700
Airport	N/A	2010	N/A	TBC	Minimal
Total	21.5*			2,550	1,495

*The Initial Advice Statement identified a tonnage increase of 8 Mtpa for the Goonyella Riverside Mine Expansion, this has been revised up to approximately 9.5 Mtpa, increasing the total incremental tonnes from BBCGP to 21.5 Mtpa.



Source: BMA Supplied Drawing (April 2008) GM-0214.cdr

Client



BHP Billiton Mitsubishi Alliance



Project

CAVAL RIDGE PROJECT
ENVIRONMENTAL IMPACT STATEMENT
EXECUTIVE SUMMARY

Drawn: VH	Approved: RS	Date: 08-05-2009
Job No.: 4262 6158	File No. 42626158-g-609.cdr	

Title

PROJECT LOCATION

Figure: 1

Rev. A
A4

This drawing is subject to COPYRIGHT. It remains the property of URS Australia Pty Ltd.



1.2 Caval Ridge Project

BMA, the proponent, has prepared this environmental impact Statement (EIS) to assess the environmental, social and economic impacts associated with the development of a multi-seam open cut coal mine at Caval Ridge, south-west of Moranbah and approximately 160 km south-west of Mackay, Queensland. The northern most boundary of the mine will be approximately 6 km south of Moranbah, while the mine industrial area (MIA) and coal handling and preparation plant (CHPP) will be about 16 km from Moranbah (Figure 1).

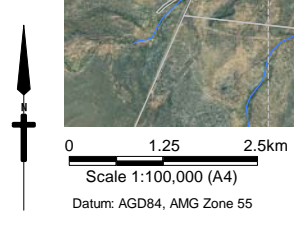
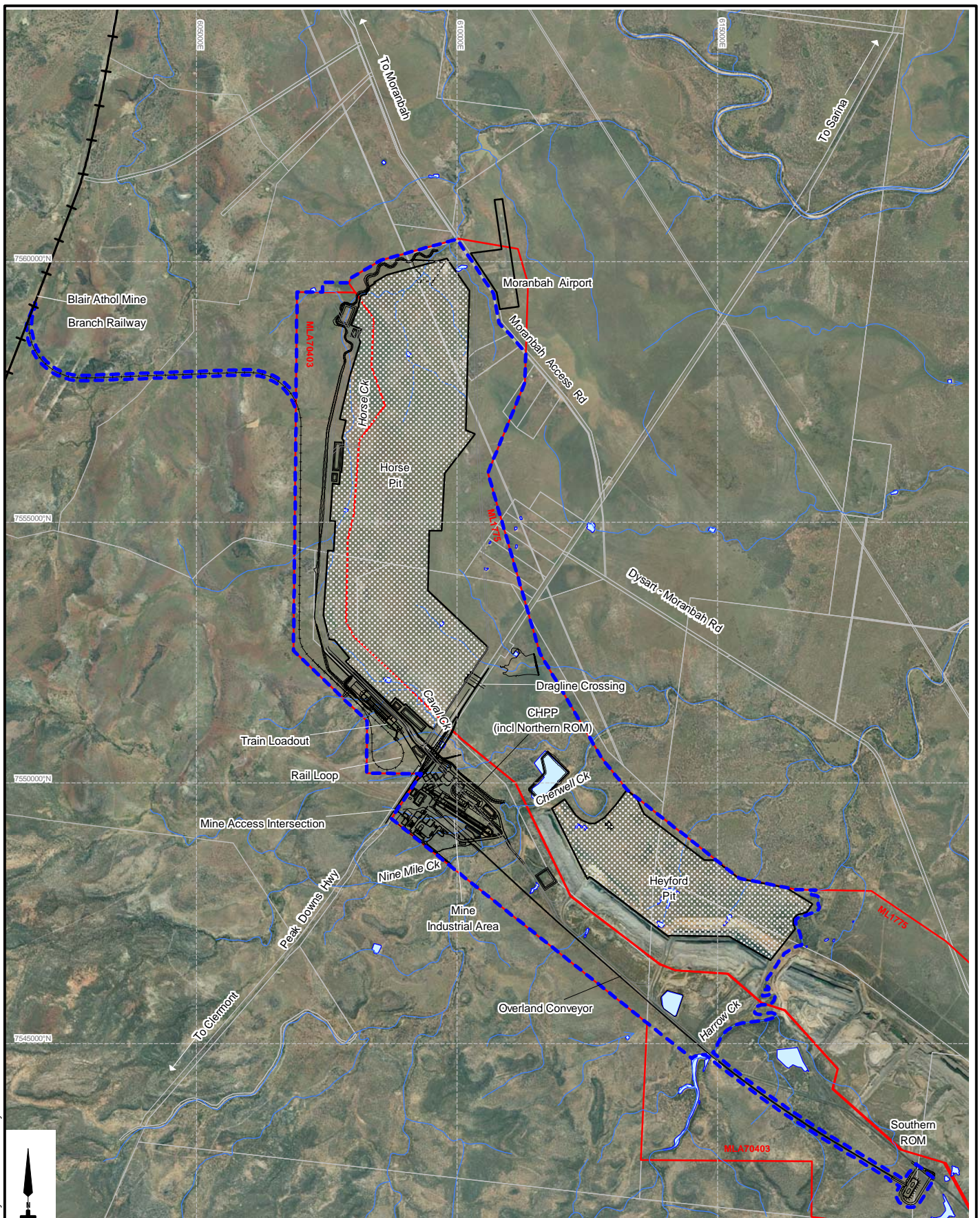
The project's mining area will be located on ML 1775, while the MIA and other supporting infrastructure like overland conveyor, rail spur and loop and haul roads will be located on MLA 70403. The project layout is presented in Figure 2.

The project includes a new coal mine producing 5.5 Million tonnes per annum (Mtpa). The project will use a combination of draglines and a truck-shovel fleet. Mining activities will include clearing vegetation, topsoil stripping, removing overburden to in pit and out-of-pit spoil dumps, coal mining and progressive rehabilitation.

The Caval Ridge CHPP will process an additional 2.5 Mtpa from Peak Downs Mine, to produce 8 Mtpa of hard coking coal for the export market over a life of approximately 30 years. Construction is expected to commence in 2010, with first coal being produced in 2013.

The key benefits of the project will include:

- A total of 1200 construction jobs, 495 operational jobs and flow-on indirect employment opportunities.
- Export income.
- Revenue into the regional economy.
- Significant State and Government taxes and royalties.



- Project Site
- Proposed Pit
- Mining Lease
- Proposed Infrastructure

Source: Client Supplied Data

Client 	Project CAVAL RIDGE PROJECT ENVIRONMENTAL IMPACT STATEMENT EXECUTIVE SUMMARY		Title PROJECT SITE	
	Drawn: VH Job No: 4262 6158	Approved: RS File No: 42626158-g-610b.wor	Date: 23-05-2009	Figure: 2

This drawing is subject to COPYRIGHT. It remains the property of URS Australia Pty Ltd.



Consultation with the community and stakeholders highlighted the potential impact of the project on air quality, noise and local accommodation as important. Consultation also highlighted the importance of the economic contribution of new mines to the local and regional economy. BMA understands the role they need to play in developing collaborative solutions with government and industry. Further summaries of the project and key studies are provided below.

2 Project Overview

The key elements of the project are:

- An open cut coal mine will be constructed on the northern section of the Peak Downs Mining Lease (ML 1775) generating up to 5.5 Mtpa of product coal. An additional 2.5 Mtpa will be sourced from Peak Downs Mine and processed at the Caval Ridge CHPP, to produce approximately 8 Mtpa of product coal for the export market.
- The product coal will be railed to the Hay Point and Dalrymple Bay coal terminals for export to international markets. There will be an opportunity to rail the product coal via the Abbot Point Coal Terminal upon completion of the proposed Northern Missing Link rail line.
- Out-of-pit spoil dumps will be created to the west of ML 1775 on MLA 70403 . Once there is sufficient space for in-pit dumping, pits will be progressively backfilled with spoil (in-pit spoil dumps).
- A mine water management system will be constructed that diverts clean water, captures and manages mine area runoff and pit water for reuse.
- Mine haul roads will connect open cut pits to the new CHPP on MLA 70403.
- The Peak Downs Highway will be elevated to cross over the haul road and infrastructure corridor, thus separating the public from the mining operation.
- An overland conveyor will be constructed to transfer run of mine (ROM) coal from the Southern ROM to the Caval Ridge CHPP.
- A conveyor will be constructed to transfer product coal from the CHPP to the train loadout located on MLA 70403.
- Power will be supplied via an overhead 66 kilovolt (kV) transmission line from the Moranbah 66 kV line.
- Process waste comprising both coal rejects and dewatered tailings from the CHPP will be returned by truck and disposed of in the project's spoil dumps.
- Process water will be supplied using a combination of reuse from sediment dams on the project site, and additional water supply from the Process Water Dam, which is supplied from the existing Eungella-Bingegang pipeline.
- The project will be accessed via the Peak Downs Highway.
- The rail spur and loop will be constructed from the main Blair Athol Line.
- The mine industrial area (MIA) including: site offices, workshops, stores, magazine, communications, car parking and some other minor facilities will be constructed on MLA 70403.



BMA will contract the construction of the CHPP to a construction contractor, while BMA will operate the mine and CHPP. The project workforce will include about 1,200 construction employees and about 495 operational employees.

3 The Proponent

The project proponent is BHP Billiton Mitsubishi Alliance Coal Operations Pty Ltd as manager and agent on behalf of the Central Queensland Coal Associates Joint Venture (CQCA). CQCA is an unincorporated joint venture between BHP Billiton (50 %) and Mitsubishi Corp. (50 %). Joint venture arrangements are regulated in accordance with the C.Q.C.A. Joint Venture Agreement as amended most recently by Deed dated 28 June 2001 and a Strategic Alliance Agreement dated 28 June 2001 which created BMA.

Operations are managed by BMA on behalf of the CQCA Joint Venturers under a Management Agreement dated 28 June 2001. BMA has equal ownership and management of seven Central Queensland coal mines: Peak Downs, Goonyella Riverside, Broadmeadow, Saraji, Norwich Park, Gregory Crinum and Blackwater, and also manages the Hay Point Coal Terminal near Mackay, Queensland.

In addition, BMA manages the operations of BHP Mitsui Coal, which is owned by BHP Billiton (80 %) and Mitsui and Co (20 %). These operations include the South Walker Creek Mine and Poitrel Mine. BMA's operations provide significant benefits to the local communities, the broader Central Queensland region and to the Queensland economy as a whole. BMA is the largest employer in the region and plays a key role in the economic development of Central Queensland.

4 Project Need and Alternatives

4.1 Project Need

Australia is the world's largest exporter of coal and Queensland is responsible for about two thirds of exported coal (DME, 2007). Coal is the state's most important export commodity, earning Australia around \$10 billion. In the financial year ending 30 June 2008, coal contributed \$1.04 billion in royalties to the Queensland Government. Based on changes to royalties announced in the Queensland State Budget 2008-09, royalties from coal are projected to rise to over \$3.21 billion in 2008-09. The industry is also a mainstay of rail and port services in Central Queensland.

The project's high quality hard coking coal is attractive to overseas buyers. The project forms part of a growth strategy designed to strategically service the expanding demands of India, China and other international metallurgical coal markets.

The coal industry in Queensland employs about 20,000 people directly. A further 70,000 indirect jobs are created through the industry's activities. At full production, the project will directly employ approximately 495 people, with many more employed indirectly as a result of flow-on effects.

An initial capital investment of approximately \$4 billion will be required to bring the project to full production. Operational expenditure will be about \$450-500 million per annum for the mine life. The operation will contribute significantly to the state in rail freight charges and coal royalties. This contribution coupled with the direct and indirect employment opportunities and associated spending, highlights the value of the project to Queensland.

4.2 Project Alternatives

In the event the project was not to proceed this would result in loss of direct and indirect employment opportunities. Export income would not be realised resulting in a lost opportunity to inject revenue into the regional economy as well as state and commonwealth government taxes and royalties not being generated.

All components of the project were analysed and various alternatives were considered for the project. The location of the project is restricted by the location of the resource and the location of the mining lease.

The open cut mining method was selected based on the relatively shallow depth of coal and the multi seam stratigraphy of the deposit. Underground mining was considered however due to the seam geometry and thickness it was not regarded as an appropriate method given the lower resource recovery which would have resulted.

Due to the location of the resource and the topography, the diversion of Harrow and Caval Creek will be required. Various alternatives to the design of the diversions were considered to ensure appropriate stream bed grades and stream flows. No diversion of Cherwell Creek and Harrow Creek is planned at this part of the development.

Local power requirements were reviewed when the power alternatives were considered. Considering current load estimates for Caval Ridge Mine and the additional loads around Peak Downs Mine are in excess of available capacity, and cannot be supported from the present Utah 1 Feeder or the existing Moranbah substation, the construction of a new substation has been considered. This new substation will not provide power directly to the Caval Ridge Mine, but it will help free up load currently delivered from the Moranbah substation to the Goonyella and Riverside feeders and this freed up load will provide a solution to the Caval Ridge Mine's power needs. The new substation will also add additional capacity to support the power needs for other expansion projects identified in the first stages of growth (such as Goonyella Riverside expansion).

The site water balance indicates that an external water supply (3200 ML/year) is required, as there is an overall deficit of water on site. Various external water supply options were considered, including harvesting water from nearby water courses, supply from the Eungella-Bingegang pipeline and harvesting groundwater on site, and in the vicinity of the site.

The harvesting options were not considered viable given the ephemeral nature of the water courses and the likely difficulty in gaining new water allocations within the region. Groundwater was not considered as a reliable water supply for the project, as there is little reliable groundwater yield on site or from bores in the vicinity of the site. Hence, the supply of water from the Eungella-Bingegang pipeline was considered the most reliable water supply option.

The location of the project resulted in rail being the only alternative being considered for transporting the product coal. The project is located between the Peak Downs and Blair Athol Railway lines so there is the potential to transport coal via either of these lines and both of these options were considered. The Peak Downs line option was considered but was discounted for several reasons including cost, unsuitable terrain and impacts on current operations. The final route and balloon loop, connecting the project site to the Blair Athol line, meet QR requirements and seek to minimise the length of spur and impact on existing infrastructure.



Finally, based on the forecasts of an operational workforce for the Caval Ridge mine operations and the associated demographic profiles, a number of different types of permanent accommodation has been planned including village accommodation, units and houses. A number of BMA owned parcels of land within Moranbah have been identified for development / redevelopment to cater for accommodation needs for both the Caval Ridge operational workforce and the ongoing requirements of the other BMA operations.

5 Stakeholders and Consultation

BMA is undertaking an extensive program of community consultation and stakeholder engagement relating to the Caval Ridge Project, which aims to identify community issues or concerns, ensure BMA is responsive in mitigating against issues, proactively work with stakeholders, and continue the long term relationship between BMA and Central Queensland communities.

The Caval Ridge Project community engagement process also considers the cumulative impacts of BMA's operations and helps the community to understand the project specifically, as well as BMA's broader growth plans. The community consultation process to date has engaged stakeholders at both local and regional level, and provided Project-specific information as well as information on the potential social, economic and environmental impacts.

While community is generally supportive of the project and BMA's growth plans, key community issues and concerns relating to the project include:

- Accommodation options and locations
- Environmental issues such as noise, dust and vibration
- Timeframes (construction and operation)
- Proximity to the Moranbah community
- Employment opportunities
- Opportunities to provide services
- Negative and positive impact of DIDO/FIFO workforces
- Pressures on social services and facilities including emergency and health services.

6 Approval Process

On 4 July 2008 the Coordinator-General (CG) declared the BMA BBCGP a significant project for which an EIS is required in accordance with Part 4 of the State Development and Public Works Organisation Act 1971 (SDPWO Act). The Terms of Reference for the BMA BBCGP set out a phased process for assessing the environmental impacts of each element of the BMA BBCGP. As discussed earlier, the Caval Ridge Project is the subject of this EIS, and is the second element of the BMA BBCGP for which an EIS has been completed.

The DIP will be responsible for coordinating the EIS assessment process and at the end of the process the Coordinator-General will report on the process and the project's environmental acceptability.



The Commonwealth Minister of Environment, Heritage and the Arts determined on 23 September 2008 that the Caval Ridge Project constitutes a controlled action under Section 75 of the EPBC Act, as there is likely to be a significant impact on matters of national environmental significance. The EIS process will also serve to address the matters of national environmental significance identified by the Minister. The project will be assessed under the bilateral agreement between the Commonwealth Government and the Queensland Government.

Following the EIS approvals, additional approvals will be sought for the operations including an Environmental Authority under the Environmental Protection Act 1994.

7 Environmental Management

The potential environmental impacts of the project on the environment were identified during a number of baseline surveys and impact assessments. The out comes of these studies are summarised below:

7.1 Land Resources

Mining and cattle grazing are the predominant land use within the Bowen Basin region. Mackay is the main urban and administrative hub for the region, while Moranbah, a purpose-built mining town, and falls within the Isaac Regional Council area.

The section of project site north of Cherwell Creek has been partially cleared for grazing, while Heyford Pit to the south was previously mined.

BMA has a mining lease (ML1775) and mining lease application (MLA 70403) over the project site and is the land owner for the majority of the properties underlying the mining lease and application. The coal mining operations will be undertaken on ML 1775. MLA 70403 which is located to the west of ML 1775, is required for project related infrastructure (haul roads, rail spur and loop, train load-out, sediment basins, coal reject stockpile, etc), and temporary landforms.

The underlying land tenure for the project site is predominantly freehold, with some areas designated as special lease or special purpose. The majority of these land parcels have been acquired by BHP Billiton Coal (and their associated parties), and leased to graziers and commercial businesses.

Easements and reserves in the area include:

- Powerlines - Two overhead transmission line easements (66 kV and 11 kV) are in close proximity or cross the project site.
- Peak Downs Highway road reserve that transects the centre of the project site and the Moranbah Access Road that forms the north eastern boundary of the project site. An overpass will be constructed to minimise interaction with mining operations and the public.
- Blair Athol railway line to the north-west of the project site, from which a rail spur will require construction within the Blair Athol railway easement.



- Peak Downs Highway stock route (which follows the Peak Downs Highway), traversing the central section of the project site, will be realigned at the proposed Peak Downs Highway overpass to ensure continuity of the stock route.

The overriding principle is to maintain the most beneficial future use of land that can be sustained in view of the range of limiting factors. The proposed post-mining land use for the project site is expected to be a mosaic of self sustaining vegetation communities and grazing land. In order to sustain the desired land use without degradation, it is important that the post-mining land only be used in accordance with the limits of the agricultural suitability class.

7.2 Scenic Values

A number of key landscape features that comprise the visual character of the project site and surrounding areas were identified, including the Isaac River, Moranbah Township, public roads (Peak Downs Highway, Moranbah Access Road, and Dysart-Moranbah Road), Moranbah airport and Moranbah railway station.

The landscape quality of the project site has been significantly altered by agricultural land uses over many years and more recently by open cut mining. The current landscape quality is considered to be Medium in accordance with the BLM system.

Potential visual impacts associated with the project will result primarily from the construction of:

- Out-of-pit overburden dumps.
- New overpass along the Peak Downs Highway.
- CHPP structures.
- Coal loading facilities.
- Administration buildings.

A range of mitigation measures are proposed to minimise the potential visual impact of project. These mitigation measures would be applied in particular locations as required to achieve the most appropriate outcome. These include:

- Earth mounding with tree and shrub planting.
- Tree and shrub planting in natural ground.
- Retention of existing vegetation buffer zones.
- Management of natural regeneration in buffer zones.
- Colour selection for various structures including the CHPP, loading facilities, administration and other buildings.
- Lighting design for the MIA including the ROM, CHPP infrastructure and conveyors.

7.3 Mineral Waste

Mineral wastes are those generated through mining and coal processing. Through the mining of coal overburden and interburden (siltstone and sandstone) is removed and will be deposited in spoil dumps. The majority of spoil dumps will be input. Coal processing wastes (coal rejects and fine coal tailings) will be disposed of as dewatered solids within the in-pit spoil dumps.

Over a 30-year mine life, the total mined overburden and interburden volumes from the Horse and Heyford Pits (combined) are expected to approximate over 1,600 million bulk cubic metres (Mbcm). Over this period approximately 215 Mt of processing wastes, in the form of coarse and fine coal reject material, is expected to be produced. This is anticipated be composed of 80% coarse reject material and 20% fine dewatered tailings.

All overburden/interburden and almost all potential rejects tested are non acid forming (NAF), and have very low total sulphur contents. The high acid neutralising capacity (ANC) of many of the samples combined with the very low sulphur concentrations indicates there would be excess alkalinity to buffer the small quantity of acid that could potentially be produced by a very small proportion of the likely mineral waste materials.

Overall, the majority of coarse rejects and tailings have little or no capacity to generate acid and all materials appear to retain a modest neutralising capacity. This is similar to Peak Downs Mine where the ROM stockpile and the tailing storage facility (TSF) are not known for generating acid seepage. Therefore, rejects from Peak Downs Mine coal to be processed and disposed at the project are not expected to generate acid. Rejects from Peak Downs Mine disposed of at the project site are not expected to cause environmental issues with respect to metal and salt concentrations in leachate.

The overburden and potential reject materials had variously elevated ESP values (8.5 - 25%), indicating that it is marginally sodic to sodic and may be prone to dispersion. Treatment of all sodic overburden (and potential reject materials) would be required if these are to be used as vegetation growth medium.

The design of a mineral waste management strategy for the project will focus on: placement of mineral waste materials to minimise run-off and erosion; and evaluating the geochemical characteristics of materials from untested areas or lithologies that have not been evaluated.

The assessment has identified that almost all overburden and potential reject materials are expected to be NAF, with a very small proportion of potential reject materials with a capacity to generate small quantities of acid. As a result no specific management measures are likely to be required to manage potential acid generation in spoil or rejects.

7.4 Surface Water

The watercourses within the project site, which are all ephemeral, include Cherwell Creek, Harrow Creek, Nine Mile Creek, Caval Creek (an unnamed creek, named Caval for project identification purposes) and Horse Creek, which are tributaries of the Isaac River and part of the Fitzroy River catchment.

Existing water quality is generally within the Queensland Water Quality Guidelines water quality objectives, with the exception of turbidity, pH (slight exceedance), nitrogen & phosphorus.



A flooding assessment for Cherwell Creek, Harrow Creek, Nine Mile Creek, Caval Creek and Horse Creek was undertaken for a range of flow events up to the 100 year Average Recurrence Interval (ARI). The flood extents for the existing and developed project site have been determined using a hydraulic model.

Flood levels in

- Cherwell Creek are controlled by the creek banks except at the junction of tributary creeks (Nine Mile Creek, Harrow Creek and Caval Creek), where flood levels extend into the floodplains.
- Harrow Creek are generally maintained within the creek banks with the exception of > Q100 events, where the flood waters extend onto the surrounding floodplains.
- Nine Mile Creek up to the Q100 are contained within the main channel.
- Caval Creek flood levels are contained within the channel banks, except at the junction of Caval and Cherwell Creek.
- Horse Creek (upstream section) contains all flow events up to and including the Q100.

The potential impacts for the operational phase of the project include: water management system failures, erosion and sediment mobilisation, creek diversions and flooding. These impacts will be managed through appropriate design and maintenance of mine water management infrastructure (sediment basins, pit/process water dams, industrial area runoff dams, flood protection levees, erosion and sediment control measures), and through use of erosion and sediment control, water management strategies, monitoring plans and emergency response procedures.

Raw water (5,500 ML per annum) will be required for project operation. This will be used for potable water supply, CHPP make-up water and dust suppression. External raw water will be supplied to the project via a new buried pipeline off-take from the Eungella – Bingegang pipeline. The pipeline will follow the Peak Downs Highway to the MIA. Internal raw water supply will be sourced and recycled from the mine water management system.

The proposed mine water management system is a combination of storages (for water collection, treatment and release) interconnected by open channels, and pumps and pipelines used to transfer mine water between storages, to demands and to dewater mining pits. The mine water management system has been designed to: divert clean catchment away from areas disturbed by mining activities; progressively rehabilitate spoil stockpiles; treat runoff from all disturbed areas (haul roads, MIA etc); and maximise reuse of water from the mine water management system to meet mine demands, to reduce likelihood of off-site discharge and requirement for external water supply.

7.5 Groundwater

Groundwater occurs in the unconsolidated and consolidated sedimentary rocks and basalts in the vicinity of the project site. These groundwaters are used for stock and domestic supply, principally in the beef cattle industry. A total of 13 groundwater bores were identified within 10 km of the project site.



The development, operation and closure of the mine has the potential to impact on the groundwater resources of the area, principally by altering groundwater flow patterns and causing drawdown of groundwater levels.

Water quality at the site is characterised as brackish to brine and is not expected to change throughout the operation. Groundwater will be continually extracted from the open cut pit preventing the movement of the potentially lower quality groundwater away from the mine and into the surrounding aquifers. Aquifers outside the mine will continue to receive recharge via the same processes that occur pre-mining.

Groundwater ingress into the open pit mines will cause groundwater drawdown around the pits, which in turn will cause regional groundwater levels to lower. The radius of influence of the drawdown of groundwater level (distance to negligible drawdown) is expected to be in the order of 1,800 m. No groundwater users have been identified within 2 km from the site, thus it is anticipated that the proposed mine activities and subsequent groundwater drawdown will not have a significant impact on regional groundwater users of the Permian aquifers.

Given that water quality is not expected to change as a result of mine activities, and the proximity of groundwater users to the site, it is anticipated that there will be no significant impacts on neighbouring groundwater users. However a groundwater monitoring program comprising regular water level measurement and water quality assessment will be implemented.

As mining continues, further data collection is recommended in order to develop a comprehensive mine closure plan, including the modelling and assessment of water quality within the final void(s).

7.6 Project Site Ecology

7.6.1 Terrestrial Flora

7.6.1.1 Regional Ecosystems

Ground-truthing has confirmed that 19 distinct vegetation communities occur within the project site. Fourteen of the communities identified are currently mapped as remnant (i.e. as regional ecosystems (REs)) under the provisions of the Vegetation Management Act (VM Act), while an additional community (vegetation community 14) is comparable to RE 11.9.5. Of the fifteen ground-truthed remnant communities, eight have a Not of Concern management status, four have an Of Concern management status and three have an Endangered management status under the provisions of the VM Act, while five are comparable to ecological communities listed as Endangered under the Environmental Protection and Biodiversity Conservation Act (EPBC Act). The latter includes:

- Brigalow (*Acacia harpophylla* dominant and co-dominant) communities - (comparable to REs 11.4.8, 11.4.9 and 11.9.5).
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin – (comparable to RE 11.8.11).

7.6.1.2 Terrestrial Flora Species

A search of the Queensland Herbarium's records via the EPA's Wildlife Online database indicates that one terrestrial plant species of special conservation significance, *Bertya pedicellata* (a shrub with no common name listed as Rare under the NC Act), occurs within the locality of the project site.

- The EPBC Act Online Protected Matters Search Tool results indicate that two species of special conservation significance may occur within the vicinity of the project site, as follows:
- King Blue-grass (*Dichanthium queenslandicum*) - Vulnerable NC Act, Vulnerable EPBC Act.
- Finger Panic Grass (*Digitaria porrecta*) - Rare NC Act, Endangered EPBC Act.

A previous ecological assessment undertaken for the adjacent Peak Downs mining lease (including southern sections of the current project site) by Ecoserve and LAMR (2005) also indicated that, although not recorded during surveys, King Blue-grass and Queensland Blue-grass (*Dichanthium setosum* - Vulnerable EPBC Act, Rare NC Act) both have a "reasonable probability of occurrence on the site in either Regional Ecosystems 11.8.5 or 11.8.11."

A ground survey of the project site recorded 176 flora species, of which 157 (89.2%) were native and 19 (10.8%) were exotic. This includes species recorded during formal survey transects, as well as incidental records from across the project site. No flora species listed as significant under the provisions of the NC Act or the EPBC Act were recorded within the project site during ground survey.

During the construction phase, clearing will be required for a range of infrastructure within the project site, along with a number of sediment basins, creek diversions, the initial open-cut mining pit(s), ramps and out of pit waste dump areas. Clearing will also occur progressively during mine operation for the extension of pits and spoil areas. Overall, a total area of approximately 3,900 ha will be disturbed over the life of the project. This will incorporate the clearing of remnant vegetation as defined under the provisions of the VM Act as well as non-remnant vegetation.

A biodiversity offset management plan will be developed and implemented to manage the offsetting of cleared significant vegetation communities. The plan will be developed in keeping with the objectives of the current Commonwealth and State legislation for the offsetting of significant vegetation communities. The plan will also be in keeping with the principles of relevant policies and guidelines such as:

- Draft policy statement 'Use of environmental offsets under the EPBC Act 1999' (DEWHA, 2007)
- Queensland Policy for Vegetation Management Offsets (DNRW, 2007)
- Queensland Government Environmental Offset Policy.

7.6.1.3 Declared Weed Species

The project site has been extensively invaded by exotic weed species, four of which have been declared as Class 2 weeds and one as a Class 3 weed under the Provisions of the Land Protection Act. Recorded weed species on the site were:

- Mother of Millions (*Bryophyllum delagoense*).
- Harrisia Cactus (*Eriocereus martini*).
- Lantana (*Lantana camara*).
- Velvet Tree-pear (*Opuntia tomentosa*).
- Parthenium Weed (*Parthenium hysterophorus*).

7.6.2 Terrestrial Fauna

Two species listed as Vulnerable under the EPBC Act, Ornamental Snake Denisonia maculata and Squatter Pigeon (southern subspecies) Geophaps scripta scripta, have been recorded on the project site and/or the adjacent Peak Downs Mine, while another four, Brigalow Scaly-foot Paradelma orientalis, Yakka Skink Egernia rugosa, Australian Painted Snipe Rostratula australis, and Greater Long-eared Bat (South-eastern) Nyctophilus timoriensis, are predicted to occur or it is considered possible that they may occur. Fourteen bird species listed as Migratory under the EPBC Act have also been recorded. These species have been considered as part of the assessment of significance of impacts for these and other Matters of National Environmental Significance.

No corridors are mapped for the project site at the state, regional or local levels under the Biodiversity Planning Assessment. No legislative constraints for any proposed activities are anticipated in regards to movement corridors.

There are a number of pest animal species known or considered likely to be present within the project site. By law, landholders are required to control Class 2 pest species.

In addition to mitigation measures proposed for managing the potential impacts on flora, the following mitigation and compensatory measures will be implemented to reduce potential impacts on fauna:

- Fauna spotter/catchers present during certain clearing operations in areas of high ecological value.
- Implement measures to reduce fauna mortality on roads and ensure appropriate treatment of injured/orphaned animals (e.g. driver awareness).
- Retention (or provision in surrounding habitat), where possible, of important habitat features such as large hollow-bearing trees (live or dead), nest boxes and log piles.

The restoration of naturally occurring riparian systems and installation of appropriate fences, culverts and bridges will also represent an opportunity to facilitate fauna movement opportunities across the project site.

A contractor's construction environmental management plan will manage potential habitat impacts during the construction phase, while the site environmental management plan will manage habitat impacts during operation and decommissioning.

7.6.3 Aquatic Fauna and Flora

Aquatic habitats within the project site consist of natural streams and drainage lines, predominantly associated with Cherwell Creek, which flows in the Isaac River approximately 20-30 km downstream of the project site, but also Horse Creek and Nine-Mile Creek, and a number of artificial waterbodies in the form of mine and farm dams, including the modified (dammed) channel of Harrow Creek. All natural drainage lines occurring within the project site are ephemeral, as indicated by deep sandy stream beds and an absence of aquatic (and often riparian) vegetation, with the frequency of flows expected to be considerably reduced and restricted to periods of heavy rainfall, while the artificial dams contain water throughout the year.

No aquatic fauna of special conservation significance were recorded during current or previous surveys of the project site and immediate surrounds. The ephemeral nature of the natural drainage lines and their substrate within the project site mean that flows of any substance are likely to be restricted to periods of, and immediately after, heavy rainfall.

In addition to, and in combination with, the mitigation measures described for terrestrial flora and fauna, the maintenance of environmental flows within the project site's natural drainage systems is significant in that the riparian zone provides refuge habitat and facilitates movement throughout the local area. Many plant and animal species rely on these areas for survival within the predominantly dry landscape.

The alterations to the present courses of Caval and Horse Creeks, the creation of additional dams and the crossing of Caval and Cherwell Creeks during dragline transport between the pits may represent an issue for environmental flows and water quality. As these systems are ephemeral, any diversions and transporting of draglines should occur during dry conditions with minimal impacts on aquatic species, provided disturbance and fuel spills are minimised and natural creek bank morphology is restored. Environmental flows should also be maintained through controlled release from dams, as required.

If rehabilitation efforts focus on the restoration of naturally occurring riparian systems, restoration of the movement corridors and improvements to water quality are likely to occur. Areas to be rehabilitated will also represent an opportunity to facilitate or enhance fauna movement and restore the pre-clearing vegetation community types.

7.7 Air Quality

Ambient air monitoring data suggests that the existing air quality at this location is good, with no exceedences of the EPP (Air) objectives for dust recorded at the project site during 2008.

Potential dust emissions from mining activities have been assessed and used in dispersion modelling to predict potential impacts (typical, worst case and upset conditions) at nearby residential locations.

Results of the dispersion modelling suggest that air quality impacts due to construction activities in Year 1 are below the EPP (Air) objectives for TSP, PM_{2.5} and dust deposition at residential locations. Operational impacts in Year 2 and Year 20 also satisfy the EPP (Air) objectives for TSP, PM_{2.5} and dust deposition for typical operating conditions.

The dispersion modelling highlights the potential for PM₁₀ levels to exceed the EPP (Air) objective of 50 µg/m³ for the 24-hour average concentration, at some sensitive receptor locations, for each of the three year scenarios. A detailed investigation into modelled worst-case meteorological conditions highlights the



strong dependence of the model results on the model default value of the mixing height which plays a key role in the calculation of night time impacts.

Impacts under worst-case short-term operating conditions, accounting for the possible proximity of key dust-generating equipment to either the north or south of each pit, show that high dust levels are possible to the north of the project under adverse meteorological conditions. An ambient air monitoring program has been developed that will monitor the impact of dust-generating emission sources at sensitive receptor locations. The information obtained from the monitoring program will feed into the operational management of site-based dust emission sources.

The occurrence of these upset conditions will be managed by BMA by ensuring that adequate dust suppression measures are maintained at all times.

Mitigation measures will be implemented including:

- Engineering controls
- Dust suppression measures
- Rehabilitation of exposed surfaces
- Operational procedures
- Measurement of ambient air quality.

A contractor's environmental management plan and site operational environmental management plan will be developed and will include the management of dust issues.

7.8 Greenhouse Gases

BMA acknowledges the risks posed by climate change associated with increasing greenhouse gas concentrations in the atmosphere. BMA has developed a corporate climate change approach with actions focused in the following areas:

- Working collaboratively with government, industry, communities and employees to reduce emissions, including:
 - contributing approximately \$130 million over ten years to the \$1 billion COAL21 Fund established by the Australian coal industry to support the research and demonstration of low emissions coal utilisation technologies; and
 - raising awareness within the BMA workforce and neighbouring communities and providing support to greenhouse abatement projects.
- Improving the management of energy and greenhouse gas emissions from coal production, in particular:
 - adopting energy and greenhouse gas intensity reduction targets of 0.3% and 5.6% respectively by 2012.



BHP Billiton Mitsubishi Alliance

- employing the company's Energy Excellence Program to identify and implement opportunities for improved energy efficiency in mining operations.
- investigating the potential recovery and utilisation of coal seam methane at several BMA sites.
- Transparent reporting of BMA's emissions profile.

An estimation of the greenhouse gas (GHG) inventory for the Caval Ridge Mine has been developed based on the accounting and reporting principles within the Greenhouse Gas Protocol (2004) and a project life of 30 years beginning in 2012. The Scope 1 emission sources from the project included in this inventory are:

- Fugitive emissions of coal seam gas (CSG) from the open cut mining of coal
- Diesel consumption in vehicles
- Use of explosives.

The Scope 2 emissions from the project result from the purchasing of electricity for drag lines, coal handling and preparation plants, lighting and facilities.

The Scope 3 emissions from the project considered in this assessment are the following:

- End use of the coal in metallurgical uses as coking coal.
- Transport of the coal via rail to Hay Point Terminal, an estimated distance of 220 km.
- Handling of coal at Hay Point Terminal and an overseas terminal (assumed to be equivalent emissions to Hay Point).
- Shipping of the coal, based on average ship diesel consumption rate.

The GHG emissions estimated for the project are summarised in Table 2.

Table 2 GHG emissions estimated for the project

Scope	Source	Minimum Emissions (t CO ₂ -e / yr)	Maximum Emissions (t CO ₂ -e / yr)	Average Emissions (t CO ₂ -e / yr)	Life of Mine Emissions (t CO ₂ -e)
1	Fugitive emissions	120,129	196,359	161,647	4,849,404
1	Diesel combustion	72,450	131,595	105,818	3,174,554
1	Explosives	3,348	5,011	4,430	132,886
2	Purchased electricity	56,315	105,572	99,305	2,979,160
3	Coal rilling and terminal handling	35,370	48,634	48,192	1,445,754
3	Coal shipping	70,956	97,565	96,678	2,900,327
3	Coal End Use	10,824,000	14,883,000	14,747,700	442,431,000
Total Scope 1		233,872	319,480	271,895	8,156,843
Total Scope 1 and Scope 2		300,583	420,522	371,200	11,136,003
Total Scope 3		10,930,326	15,029,198	14,892,569	446,777,081

When viewed in an Australian or Queensland context, the Scope 1 and 2 emissions from the project are not considered materially relevant given the project emissions are 0.44% of the Queensland energy sector at peak emissions.

7.9 Noise and Vibration

Background noise levels and ambient vibration were monitored at locations in the surrounding community.

A 3-D SoundPLAN noise model was then developed, based on 3-D terrain data, to model all steady state (L90), average (Leq) and maximum (Lmax) noise emissions from the new rail spur, CHPP, overland conveyor and mobile mechanical mining plant. Both neutral and worst case weather conditions (where applicable) were modelled in accordance with the DERM's Planning for Noise Control guideline.

Predictions were then undertaken for all scenarios and a summary of these findings is presented below:

- For the steady state (L90) noise emissions from the CHPP and overland conveyor, three locations exceeded the criterion for neutral weather and one of these three locations increased by a further 6 dBA under worst case weather conditions.
- For average (Leq) noise emissions from processing plant and/or overland conveyors and/or train movements on the new rail spur and/or mobile mechanical plant involved in mining, nine locations exceeded the criterion for neutral weather. Under worst-case weather conditions, the exceedence at one of these locations increased by 5 dBA and three properties were identified to now have minor (up to 3 dBA) exceedences.
- For maximum (Lmax) noise emissions from train or mobile mechanical plant, three locations are predicted to exceed under neutral weather conditions and they remain the only three locations under worst case conditions also.

The results indicate that the LAeq operational noise levels from the Caval Ridge Mine could increase by 2 to 3 dBA under worst case weather conditions, relative to neutral conditions, at the closest (e.g. worst case) distance to the properties. At greater distances, increases of 4 to 5 dBA are predicted due to worst case weather conditions.

No adverse noise impacts are predicted for road transportation into and out of the project site.

Six locations are predicted to exceed the blasting criteria. Only one of these six locations is not currently owned by BMA, however it is owned by a neighbouring miner.

A suite of mitigation measures were investigated for those properties that exceeded the criteria. These mitigation measures were:

- Low and Super Low noise idlers for the overland conveyor.
- Partial and full enclosure of the overland conveyor.
- Bund walls of 10 m and 20 m height.

- Upgraded silencing (eg high performance silencers) of mobile mine equipment.
- Building façade upgrades (eg double glazing) – for internal maximum noise levels only.

Predictions indicate that only two of the properties identified as exceeding any of the criteria cannot achieve compliance by the use of one or more of the above mitigation measures. At these locations, the possibility of resumption, or entering into an agreement with neighbouring miner, will need to be discussed further.

For all other locations, a comprehensive noise monitoring program will be put in place to validate the predictions before implementing mitigation measures (which in themselves are subject to further detailed design). A contractor's environmental management plan and site operational environmental management plan will be developed and will include the management of noise issues.

7.10 Traffic

The project has been divided into two distinctive phases namely construction and operations due to the different traffic demands of each phase. The construction phase will generate the highest rates of traffic due to the size of the workforce and number of deliveries. Staff will be predominantly bussed to site from the vicinity of Moranbah while goods and waste trucks are expected to primarily arrive from both Moranbah and Mackay.

The adjacent road network, particularly the Peak Downs Highway and Moranbah Access Road, are expected to experience significant traffic growth due to other industrial activities planned for the vicinity. It is unlikely that the increased impact on the road network will be sustained for more than about ten years, therefore moderate growth rates have been assumed beyond 2021.

The spatial extent of the proposed developments impact on the external road network has been defined in accordance with Department of Main Roads' Guidelines for the Assessment of Road Impacts of Developments.

Recommended road works to mitigate the traffic impacts of project are:

- Formation of a priority-controlled construction access on Peak Downs Highway to include a 220 m right turn bay and a 215 m left turn lane on the highway.
- Formation of a priority-controlled mining operations access on Peak Downs Highway to include a 220 m right turn bay and a 215 m left turn lane on the highway.
- Upgrade of the Peak Downs Highway/Winchester Road intersection to a seagull intersection in accordance with Chapter 13 of DMR's Road Planning and Design Manual.
- Upgrade of the Peak Downs Highway/Moranbah Access Road intersection to a seagull intersection in accordance with Chapter 13 of DMR's Road Planning and Design Manual.

The assumed very high background traffic growths have a significant influence on the required works.

The additional heavy vehicle demands generated by the project do not warrant developer contributions towards pavement rehabilitation. Contributions towards pavement maintenance are however warranted for



the section of the Peak Downs Highway between the site access and the Moranbah Access Road/Peak Downs Highway intersection.

7.11 Waste Management

The potential environmental impacts that may result from generation and disposal of waste will be effectively managed and reduced by the implementation of specific waste management procedures. These procedures will form an integral part of the project's environmental management plan and Environmental Management System (EMS). The EMS for the project will address waste management with an aim to minimising the quantity of waste generated and improving on the waste disposal and management techniques adopted.

7.12 Native Title and Cultural Heritage

Non-indigenous and Indigenous cultural heritage places and values were recorded as part of cultural heritage investigations.

7.12.1 Indigenous Cultural Heritage

Native title claims have been lodged over the project site by the Barada Barma Kabalbara and Yetimarla #4 group (BBKY) (claim number QC01/025). BMA has committed to ongoing discussions with the Native Title claimants to ensure that Native Title interests are captured during community consultation and the EIS process. A Cultural Heritage Management Plan (CHMP) will be developed and implemented in consultation with the Traditional Owners, and in accordance with the requirements of the ACH Act.

An Indigenous cultural heritage study was conducted in accordance with relevant provisions of the Aboriginal Cultural Heritage Act 2003 (for pre-contact Indigenous cultural heritage) and the Queensland Cultural Heritage Act 1992 (for post-contact Indigenous cultural heritage), and comprised a literature review and a field survey (between July and November 2008).

A number of Indigenous cultural heritage sites, items and significant natural features of Indigenous origin were identified, including:

- Surface stone artefacts of various types and raw materials (in disturbed and/or deflated low to high density concentrations and isolated finds) occurring mainly in association with creek and river terraces, gullies and drainage lines.
- Scarred trees with a total of 14 scars of likely cultural origin.
- Aboriginal fireplaces.
- Artefact knapping floors.
- A silcrete extraction site.
- A cultural stone feature.
- Natural features with cultural significance.
- A possible historic feature.

There is potential for the cultural values associated with the watercourses to be degraded due to erosion and sedimentation resulting from construction, diversion and operational activities. Measures to mitigate and manage adverse impacts on Indigenous cultural heritage are identified within the context of the ACH Act and associated Duty of Care Guidelines.

7.12.2 Non Indigenous Cultural Heritage

The non-indigenous cultural heritage survey (including document review and register searches) was conducted. The field survey, of the project site, did not identify any sites of cultural heritage significance, but did identify five places of historical interest. There is some potential for further historic items to exist within the project site as ground surface visibility, along with the nature of the survey did not allow for a complete survey of the area. In particular, potential exists for surface and/or subsurface road remnants along an old telegraph line where an old road potentially passed through. Elements associated with older roads and stock routes from times past may also exist in this area. Other potential sites and places may include mile markers, survey trees, historic camp remnants and associated exotic vegetation, remote graves, old station dumps and remains of early mining activities.

The project site is likely to contain low levels of local non-indigenous cultural heritage significance.

A contractor's environmental management plan and site operational environmental management plan will be developed and will include the management of cultural heritage issues.

7.13 Social Aspects

Baseline data was sourced from desktop studies, statistical and demographic reports, as well as BMA's extensive community consultation and stakeholder engagement program.

The main industry within the study area is mining, and other industry associated with mining.

The study area, and in particular Moranbah, is a growing community that has seen its resident population grow consistently in line with growth in the mining industry, in recently years. The non-resident working population has grown at a stronger rate, coinciding with increases in mining activity and workforce preferences to live in more populated suburban areas, outside the study area.

While the project is expected to increase both resident and non-resident populations, however the community's characteristics are not expected to alter significantly.

There is a robust local economy with an increasing variety of services and businesses available to residents, though local businesses have, at times, experienced difficulty in sourcing employees, due to high paying local mine jobs.

The study area has a large working age population (aged between 25 and 39 years) and more men than women. While outnumbered by men, there is a good representation of women and children in the study area and the region, and residents feel that their community is both well connected and family friendly.

There is very little unemployment in the community and a high proportion of residents earn above average incomes. The project will provide employment opportunities for local and regional workers, and is likely to build on the existing prosperity in the community, providing a degree of long-term economic stability.



The project may have impacts (actual and perceived) on the community's residential amenity. BMA will continue to be a good neighbour and actively monitor potential impacts and provide information to the community on environmental monitoring and mitigation measures for any noise, dust and vibration impacts.

There is relatively good access to community infrastructure and services, including health, education, childcare and recreation facilities. The project is likely to employ a percentage of non-resident workers which, while not expected to increase pressures on all local services, may increase demand on some services, including emergency services particularly in relation to increased traffic on roads and highways.

BMA would continue its role working to support and advocate for additional funds and resources for local service providers (for example through the Sustainable Resource Communities Fund).

BMA will continue to provide financial support for local community groups, including recreation groups, and encourage participation in activities where possible. BMA would continue to support the development or redevelopment of sporting and recreational facilities through its Community Investment program and maintain relationships with local service providers.

There has been a shortage of housing in the local and regional community, with supply not meeting demand. Housing affordability and availability has been a significant issue for the study area, particularly for non-mine workers. This trend has eased recently due to changes to the short-term economic outlook for the mining industry.

BMA has ensured that it has sufficient land available in the study area to meet the accommodation needs of its growth projects, including a temporary accommodation camp for the project's construction workforce, as well as accommodation in Moranbah for the operational workforces. BMA intends to provide a choice of suitable housing options for the project workforce.

Overall the project is expected to have limited direct social impacts on the study area; however it is likely to contribute to the cumulative impacts of mining on the community on a local and regional level.

The most significant project impacts are considered at this point to be related to accommodation supply and affordability, and the increased demand for community services.

BMA's mitigation strategies address specific project and cumulative impacts, or build on BMA's existing community support activities in the local and regional communities.

It is acknowledged that responsibility for managing and mitigating against the cumulative impacts of mining does not sit with BMA alone. All mitigation measures require the full support, participation and commitment of the local communities, service providers and in particular, state and local governments to ensure success.

7.14 Economics

The value of impacts on the regional economic environment has been assessed using input-output analysis. This approach is based on input-output tables that model the structure of an economy by describing inter-industry relationships.



The construction phase is estimated to cost AUD\$4 billion. Annual operational costs will be in the order of AUD\$450 to \$500 million. The project will provide significant economic benefits to the Mackay Region and Australian economies during its operational lifetime, these include:

- Construction is expected to increase the value added to all other industries in the Mackay Region by \$479 to \$599 million, and to raise output by \$800 million to \$1 billion in Australia, on an annual basis.
- Expenditure during construction is expected to support the equivalent of approximately 7,009 to 9,285 full-time jobs in the Mackay Region and an additional 3,675 to 4,900 full-time equivalent jobs in Australia on an annual basis.
- Operation is expected to increase the value added to all other industries in the Mackay Region by \$133 to \$167 million and raise output by \$152 to \$190 in Australia on an annual basis.
- Operation will generate an additional 804 to 1,082 jobs in the Mackay Region and an additional 744 to 992 jobs in Australia annually.
- Annual expenditure by employees in the local region is estimated at \$836,160 during construction and \$951,936 during operation.

The size of the economic impact on the local region will depend on how many of the externally sourced project employees relocate to the area permanently (or are able to be retained within the region should redundancies occur in other operations). A person who resides in an area on a permanent basis would spend more money in local businesses. This is in comparison to employees that commute to the area and reside in temporary accommodation for the duration of their shifts. These employees would have less interaction with the community and their spending in local businesses will be smaller.

Despite the recent reports of major job losses in the mining industry, the Queensland Resources Council (QRC) is still reporting that employment in the Queensland resources sector is remaining at near record levels and that the underlying skill shortages will persist as many companies continue to plan for growth. If this is the case then it is likely that the majority of the construction and operational workforces will need to be sourced from outside the region. However if the global financial crisis results in an economic downturn in the region then the pressure on the current labour market may be alleviated to some extent and a significant proportion of the workforces could be sourced from within the region.

Strategies have been provided by BMA to mitigate potential negative economic impacts and maximise the potential economic benefits that would potentially occur.

7.15 Health and Safety

BMA will implement the BHP Billiton Health, Safety, Environment and Community Management Standards that are currently in use at all BMA operations and provide the basis for effective management of employee and public health and safety. The system will adopt an integrated approach to risk management of the operations, recognising the hazards at all points in the operations and how these are controlled.

In addition to this, the project will comply with pertinent legislative and regulatory requirements.



A HAZOP study will be carried out for the project prior to construction commencing. Operational risk assessments such as Failure Mode Effect Analysis and Job Safety Analysis will be carried out on mechanical and task based exposures.

Monitoring will be undertaken to assess whether project health, safety and environment measures are being implemented and are effective. Monitoring will involve the compilation and assessment of data relating to health, safety and environment issues, such as reported near misses, accident reports and any health surveillance data (e.g. sickness data).

An Emergency Response Plan will be prepared for the construction and operation phases. General guidance for preparing emergency plans will be obtained from the QAS and the Department of Emergency Services. The Isaac Regional Council Counter Disaster Plan and the Mines Rescue Service will be considered when preparing the Emergency Response Plan in accordance with the BMA Emergency Management System. Consultation will also occur with the SES, QAS and Fire Brigade. The Isaac Regional Council will also be advised of changes as a result of the project that could affect the Regional and Mackay District Plans.

7.16 Environmental Management and Monitoring

Project operations will be managed under a certified ISO 14001 Environmental Management System.

Environmental monitoring will occur in accordance with the requirements of the Environmental Authority and will include air quality, noise, surface water, ground water and rehabilitation success.

7.17 Cumulative Impacts

There are three separate levels of cumulative impacts were considered: project site localised cumulative impacts; regional cumulative impacts; and global cumulative impacts. The only impact from the project that is potentially global is greenhouse gas emissions. However, the level of emissions from the project represents a very minor contribution at this scale. The cumulative impacts at a regional scale of the BBCGP are summarised below.

Table 3 Descriptors for Cumulative Impacts on a Regional Scale

Issue	Cumulative Impacts Descriptor	Daunia	Caval Ridge	Goonyella Riverside ¹	Airport	Comments
Production	Average annual coal production	4 Mtpa	5.5 Mtpa (+2.5 Mtpa from Peak Downs Mine)	Up to 9.5 Mtpa	Not applicable	The BMA BBCGP provides directly for an extra 21.5 Mtpa of coal production in the region. This increased production represents a significant contribution and cumulative effect on the region's socio-economic environment.
Land resources	Loss of good quality agricultural land – Class A and B Percentage of GQAL (Class A and B) lost in the Isaac Regional Council area. (Total GQAL in Isaac Regional Council area: Class A 813,000 ha; Class B 337,000 ha.)	160 ha Class A 80 ha Class B 240 ha total 0.02%	0 ha Class A 0 ha Class B 0 ha total 0%	800 ha Class A 841 ha Class B 323 ha Class B-C 1964 ha total 0.17%	To be confirmed during EIS	While a small amount of Class A Good Quality Agricultural Land is contained within the project site, this is not within the project footprint and is not expected to be disturbed.
Surface water resources	Off site water source	Braeside Pipeline Eungella Pipeline	Eungella-Bingegang pipeline	Braeside Pipeline, Burdekin Pipeline, Eungella Pipeline	To be confirmed during EIS	A Water Management Plan has been developed for the Caval Ridge Project combining storages for water collection to be used for mining related activities. The Caval Ridge Project will closely manage water consumption and release of water, use raw water, collect and reuse impacted water, and will investigate water efficiency opportunities.
	Water consumption from off-site (piped)	600 ML/yr	3200 ML/yr	1000 to 5000 ML/yr	To be confirmed during EIS	



BHP Billiton Mitsubishi Alliance

Issue	Cumulative Impacts Descriptor	Daunia	Caval Ridge	Goonyella Riverside ¹	Airport	Comments
	Project Site area compared to the total Isaac River catchment (22,400 km ²)	0.1%	0.3%	5 to 10%	To be confirmed during EIS	Mining operations temporarily interfere with catchments. The Project and the BMA BBCGP as a whole represent a small percentage of the Isaac River Catchment.
Terrestrial ecology	EPBC and VMA 'Endangered' RE cleared on site (% of total on site)	15 ha (6%)	155 ha (20%)	191 ha (23%)	To be confirmed during EIS	The project will have a minimal impact at a regional scale, however, the BMA BBCGP includes clearing over 350 ha ¹ of EPBC listed 'Endangered' RE. BMA will provide vegetation offsets for the total areas to be disturbed progressively during the BMA BBCGP assessment process. Opportunity for dispersal and movement of ground dwelling and arboreal fauna assemblages across the site is generally restricted to habitat of the Cherwell Creek riparian zone. Any disruption or fragmentation of riparian habitat will result in a loss of connectivity to the riparian corridor, and restriction of potential faunal movement across the site.
	EPBC 'Endangered' and VMA 'Of Concern' RE cleared on site (% of total on site)	0 ha (0%)	125 ha (16%)	0 ha (0%)		
	VMA 'Of Concern' RE cleared on site (% of total on site)	0 ha (0%)	378 ha (48%)	66 ha (5%)		
	VMA 'Not of Concern' RE cleared on site (% of total on site)	21 ha (94%)	374 ha (48%)	269 ha (9%)		
	Non-remnant vegetation cleared on site (% of total site)	1,750 (56%)	3,118 ha (65%)	2,457 ha (34%)		
	Fauna corridor disrupted Habitat fragmented	No No	Yes Yes	Yes Yes		
Aquatic ecology	Defined water courses removed or diverted.	0 km	9.6 km	To be confirmed during EIS	To be confirmed during EIS	Sections of two defined water courses (Horse Creek and Caval Creek) will be diverted on the Caval Ridge Project. These diversions will be designed to minimise impact on watercourses.
Greenhouse gases	Scope 1 and 2 emissions per year	0.2 Mt	0.4 Mt	2.8 Mt	To be confirmed during EIS	The total quantity of direct and indirect greenhouse gas emissions from the BMA BBCGP 2.8 Mtpa
	Scope 3 emissions per year	10 Mt	15 Mt	59 Mt		

Issue	Cumulative Impacts Descriptor	Daunia	Caval Ridge	Goonyella Riverside ¹	Airport	Comments
						represent 0.4% of Australia's 2005 emissions. Total Scope 3 emissions represent 0.17% of annual global greenhouse gas emissions.
Traffic and transport	Construction period	2009 to 2010	2011 to 2012	2011 to 2013	To be confirmed during EIS	Impacts from the project on traffic combined with an expected significant traffic growth due to other industrial activities, means the cumulative effect of the BMA BBCGP represents a significant impact. Contributions will be made for road upgrades and pavement maintenance.
	Operational traffic – light vehicles	200 vpd	165 vpd	616 vpd		
	Operational traffic – heavy vehicles	20 vpd	7 vpd	35 vpd		
	Reduction in pavement life	1% reduction in 2009 Minimal during operation	19% reduction in 2009. Additional 5% reduction in 2025, decreasing over the project life	6% reduction in 2011, additional 9% in 2012, additional 5% reduction in 2016, decreasing over the project life		
	Increase in rail carriage movements (No. / year)	400	700	550	To be confirmed during EIS	The cumulative effect of this increase is significant only if the Goonyella Railway System is used for transport of all coal. In the long term the Goonyella Riverside Mine will use the Abbott Point Port, via the proposed Northern Missing Link.
	Per cent increase in use of existing use of Goonyella Railway System	4.5%	Up to 9% ²	Up to 9% ²	Not applicable	Other changes will include switching coal from Norwich Park, currently on the Goonyella Railway System, to a new rail and train load-out facility travelling south to Gladstone. The net effect is expected to minimise impacts on the rail system.

Issue	Cumulative Impacts Descriptor	Daunia	Caval Ridge	Goonyella Riverside ¹	Airport	Comments
Social	Peak total construction workforce	450	1200	900	To be confirmed during EIS	The combined effect of the increases in workforce are expected to place a strain on the region. The consultation and social impact assessment processes initiated in this EIS will continue for other elements of the Project with a view to developing control strategies to minimise these impacts.
	Peak construction workforce in towns	45	60	90		
	Total operational workforce	300	495	700		
	Operational workforce in towns	90	75	210		
Economic	Value added to Mackay Region	\$56 – \$70 M	\$133 – \$167 M	\$130 – \$240 M	To be confirmed during EIS	
	Value added to Queensland	N/A	N/A	\$270 – \$480 M		
	Value added to Australia	\$64 – \$80 M	\$152 – \$190 M	\$130 – \$230 M		
	Jobs in Mackay Region (FTE persons)	340 – 460	804 – 1082	370 – 580	To be confirmed during EIS	
	Jobs in Queensland	N/A	N/A	460 – 710		
	Jobs in Australia	310 – 420	744-992	330 – 520		

NOTE:

1 – Information relating to the Goonyella Riverside Expansion is at this stage indicative only, as refinement of the project is in progress and detailed environmental baseline studies and impact assessments are yet to be finalised.

2 – Percentage increase to the Gooyella Rail System will be reduced if access to Abbot Point Coal Terminal is provided by the construction of the Northern Missing Link rail line.

8 Conclusion

The results of the impact assessment show that while the construction and operation of the Caval Ridge Mine have the potential to have environmental, social and economic impacts. The project design as well as ongoing monitoring and management proposed by BMA will mitigate these impacts. Commitments made by BMA to address the impacts are included in the draft Environmental Management Plan.

A number of positive impacts have also been identified both at a local as well as regional level, including generation of direct and indirect employment opportunities, contribution to local and regional economies and utilisation of a valuable resource.

The key benefits of the project will include:

- A total of 1200 construction jobs, 495 operational jobs and flow-on indirect employment opportunities.
- Export income.
- Revenue into the regional economy.
- Significant State and Government taxes and royalties

The project's high quality hard coking coal is attractive to overseas buyers. The project forms part of a growth strategy designed to strategically service the expanding demands of India, China and other international metallurgical coal markets.

The coal industry is a significant employer in Queensland, employing about 20,000 people directly and a further 70,000 indirectly through the industry's activities. At full production, the Caval Ridge project will directly employ approximately 495 people, with many more employed indirectly as a result of flow-on effects.

An initial capital investment of approximately \$4 billion will be required to bring the project to full production. Operational expenditure will be about \$450-500 million per annum for the mine life. During the mine's operational life, it will contribute significantly to the state through both rail freight charges and coal royalties. This contribution coupled with the direct and indirect employment opportunities and associated spending, highlights the value of the project to Queensland.

Overall the EIS studies found that the Caval Ridge Project benefits provide a strong justification for the project to proceed and while potential impacts have been identified, the proposed mitigation measures will minimise these impacts.