CONTINUATION OF BOGGABRI COAL MINE

ENVIRONMENTAL ASSESSMENT

Prepared by:

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SINGLETON NSW 2330

December 2010

for:

BOGGABRI COAL PTY LIMITED

386 Leard Forest Road

BOGGABRI NSW 2382

ENVIRONMENTAL ASSESSMENT STATEMENT

Submission of Environmental Assessment (EA)

Under Section 75H of the *Environmental Planning and Assessment Act 1979*

EA Prepared by	
Name	James Bailey
Qualifications	B. Natural Resources, MBA
Address	Hansen Bailey PO Box 473 SINGLETON NSW 2330
In Respect Of	Continuation of Boggabri Coal Mine
Applicant Name	Boggabri Coal Pty Limited
Applicant Address	386 Leard Forest Road BOGGABRI NSW 2382
Land to be Developed	See **Appendix B** of EA
Proposed Development	Continuation of Boggabri Coal Mine and associated activities as outlined in **Section 4** of the EA.
Environmental Assessment	An EA for the Project is attached.
Certification	I certify that I have prepared the contents of the EA, and to the best of my knowledge: • It is in accordance with Sections 75E and 75F of the *Environmental Planning and Assessment Act 1979*; • It contains all available information that is relevant to the EA of the activity to which the statement relates; and • The information contained in the statement is neither false nor misleading.
Signature	
Name	James Bailey Director
Date	December 2010

EXECUTIVE SUMMARY

BACKGROUND

Boggabri Coal Pty Limited (Boggabri Coal) is a wholly owned subsidiary of Idemitsu Australia Resources Pty Limited which operates the Boggabri Coal Mine. Boggabri Coal operates in accordance with Development Consent DA 36/88 under the *Environmental Planning and Assessment Act 1979*.

Boggabri Coal is located 15 kilometres north-east of Boggabri in the North West Region of NSW. In 2009 Boggabri Coal produced 1.5 Million tonnes of product coal from the Maules Creek Formation down to the Merriown coal seam.

Boggabri Coal Mine commenced mining operations in 2006 and has a demonstrated track record in environmental performance and achieving corporate standards, regulatory compliance and stakeholder expectations. An environmental monitoring system has confirmed that the environmental impacts from mining activities have remained well within those predicted and the criteria set by the NSW Government.

Boggabri Coal is seeking a contemporary Project Approval under Part 3A of the *Environmental Planning and Assessment Act 1979* for the continuation of its mining operations within its current mining tenements for a further 21 years (the Project).

This Environmental Assessment supports this application by addressing the Director-General's Environmental Assessment Requirements and enabling the Minister for Planning to determine the Project Application as sought.

EXISTING ENVIRONMENT

Climatic conditions in the North West Region of NSW are influenced by its latitude, inland location and relative proximity to the Nandewar Range.

The region is frequently influenced by periods of low precipitation often resulting in droughts, with the extent and severity increasing towards the west. The temperature in summer months is highest in January reaching an average daily high of 34.0°C with July being the coolest month with an average daily low temperature of 3.0°C.

Rainfall in the Namoi Valley is dominant during summer and declining in winter, with an annual average rainfall of 617 mm. Winds predominantly occur from the south-east in summer and from the north and north-west during winter. Temperature inversions are also known to occur particularly in winter months, during the night and early morning periods.

Boggabri Coal Mine is located in the Gunnedah coal basin, with coal seams generally dipping to the north north-east. Open cut mining methods at Boggabri Coal allow maximum recovery of all coal to the Merriown coal seam. Exploration drilling and feasibility studies have confirmed that up to 200 Million tonnes of open cut minable coal resource remains at Boggabri Coal within its mining and exploration leases. Current stripping ratios average approximately 1 tonne of Run of Mine coal for every 7 bank cubic metres of overburden removed.

The topography surrounding Boggabri Coal Mine is dominated by the Willow Tree Range to the north, east and west and the low lying floodplains of the Namoi River to the south. The dominant land use within and adjacent to the Project includes open cut coal mining, forestry and agricultural activities.

The mining area is located entirely within the Leard State Forest which is owned by the Crown and managed by Forests New South Wales. Boggabri Coal owns the remaining land within the Project Boundary, excluding minor areas of Crown land and road reserves. Whitehaven Coal Mining owns a portion of land to the immediate south of the mining area and Aston Resources owns some land to the north of the Project Boundary. The remaining land is predominantly privately owned.

APPROVED OPERATIONS

Boggabri Coal currently operates under Development Consent DA 36/88 which is supported by the *Boggabri Coal Project Environmental Impact Statement* (1987).

An application to modify Development Consent DA 36/88 supported by the document *Boggabri Coal Project Statement of Environmental Effects* was approved on 22 July 2009.

Boggabri Coal's planning approval, Environmental Impact Statement and Statement of Environmental Effects approves the operation of the Boggabri Coal Mine as follows:

- Open cut coal mining of up to 5 Million tonnes per annum of product coal for a period of 21 years;
- Construction of offices, workshops, bathhouse, access roads and water storage infrastructure;
- Manning up to 495 personnel;
- Combination of dragline and truck / shovel operation;
- Final void and out of pit emplacement area;
- Construction of two coal handling and preparation plants and a 3 Million cubic meter tailings dam;
- Private coal haul road and 17 kilometre rail spur and loop; and
- Train loading facility.

Approved infrastructure that has not yet been constructed includes the coal handling and preparation plants, tailings dam, rail spur and loop and the introduction of a dragline. Boggabri Coal's existing planning approval expires on 14 November 2011.

EXISTING OPERATIONS

Open cut mining is conducted via a multi-bench, multi-strip hydraulic shovel operation supported by a fleet of trucks, which provide for the greatest operational flexibility and efficiency in the staged recovery of the coal resource at Boggabri Coal.

The extraction of coal via open cut methods is currently undertaken from the Braymont, Bollol Creek, Jeralong and Merriown coal seams.

The approved mining operations at Boggabri Coal are supported by a range of infrastructure, including administration offices, bathhouses, workshops and storage facilities. Product coal is transported via a private coal haul road by a fleet of trucks to the Boggabri Coal Terminal for loading onto trains to the port of Newcastle for export.

Mining activities occur 24 hours per day 6 days per week supported by approximately 145 full time equivalent personnel. Boggabri Coal produced 1.5 Million tonnes of product coal in 2009.

Boggabri Coal manages environmental issues associated with its operations in accordance with its approved Environmental Management Plans. The Environmental Management Plans and Environmental Monitoring Program enable the effective management and measurement of its environmental performance.

Boggabri Coal will ensure its Environmental Management Plans continue to comply with legal and other requirements in relation to environmental management. The Environmental Management Plans and Environmental Monitoring Program will be revised and consolidated as appropriate to ensure consistency with the Project and the achievement of the biodiversity, water management and Aboriginal archaeology outcomes described in this Environmental Assessment.

THE PROJECT

The Project seeks to maximise operational flexibilities through staged additions and upgrades to infrastructure and an increase in approved coal production. The Project specifically seeks approval for the following:

- Continuation of Boggabri Coal Mine for a further 21 years from November 2011;
- Production of up to 7 Million tonnes per annum product coal;
- Overburden emplacement area to a maximum height of RL 395 metres;

- Construction of a Coal Handling and Preparation Plant and associated auxiliary equipment including conveyors and an ultra-fines plant. This plant will re-process fines facilitating increased resource recovery and reduce water demand;
- Closure of a section of Leard Forest Road and widening of the private coal haul road;
- Construction of a 17 kilometre rail spur and loop including a bridge over the Namoi River, Therribri Road and Kamilaroi Highway;
- Upgrading and modifying existing infrastructure (such as workshops and bathhouse), construction of additional Run of Mine coal hoppers and the extension of coal stockpiles;
- A total workforce of approximately 500 at peak production, which represents an increase of 355 from current staffing levels; and
- Construction of a 132 kV power line from near the Boggabri Coal Terminal to the mine infrastructure area.

Detailed mine planning and engineering have identified that maximum resource recovery from the proposed mining area is only feasible via open cut mining methods.

The Project will remove up to 145.28 Million tonnes Run of Mine coal and produce up to 134.48 Million tonnes of product coal. Up to 979.23 Million bank cubic meters of overburden will be moved and approximately 10.80 Million tonnes of coal reject material will be produced from the Coal Handling and Preparation Plant.

Several mine plan alternatives were considered in recognition of the principles of Ecologically Sustainable Development through environmental risk assessments and feasibility studies. The Project as presented in this Environmental Assessment has evolved with a balanced consideration of all potential environmental, social and economic impacts.

REGULATORY FRAMEWORK

A contemporary Project Approval is sought under Part 3A of the *Environmental Planning and Assessment Act 1979* for the continuation of Boggabri Coal Mine.

Boggabri Coal seeks to continue to operate under its existing planning approval until it expires on 14 November 2011.

Boggabri Coal would continue to operate under its new planning approval following the expiry of its existing planning approval.

This Environmental Assessment has been prepared consistent with the Director-General's Environmental Assessment Requirements issued on 17 December 2009 under Section 75F(2) of the *Environmental Planning and Assessment Act 1979*.

A Referral under the *Environment Protection and Biodiversity Conservation Act 1999* was submitted to the Commonwealth Department of Environment, Water, Heritage & the Arts on 15 December 2009 and was deemed to be a controlled action on 5 February 2010. The referral is being assessed as part of the bilateral process under Part 3A of the *Environmental Planning and Assessment Act 1979* in consultation with the Department of Planning.

In accordance with Section 93F of the *Environmental Planning and Assessment Act 1979*, Boggabri Coal has put in place a Voluntary Planning Agreement with the Narrabri Shire Council commensurate with the impacts of the Project.

Consistent with Section 147 of the *Environmental Planning and Assessment Act 1979*, no reportable political donations or gifts have been made by Boggabri Coal, thus making it available to the Minister to determine the Project Application.

The Project may also require and will seek as necessary, approvals under additional State and Federal legislation not exempted under Section 75U or granted consistent with Section 75V of the *Environmental Planning and Assessment Act 1979*.

STAKEHOLDER ENGAGEMENT

Boggabri Coal is well established within the local community and has undertaken stakeholder engagement on a regular basis since commencement of mining in 2006. Consultation for the Project has quite simply been the continuation of ongoing dialog with key community and Government stakeholders as part of the mine's logical progression.

Specific engagement in regard to the Project was undertaken with the aim of identifying stakeholders' issues and ensuring that these issues were appropriately assessed and responded to by Boggabri Coal either directly or in the Environmental Assessment.

Engagement was undertaken with near neighbours, the Boggabri Coal Community Consultative Committee, Boggabri Coal employees, neighbouring mines and industry, service providers, local members of Parliament, and other Government regulators including Narrabri Shire Council.

A Planning Focus Meeting was held on 9 September 2009 with representatives from the Department of Planning, Department of Environment, Climate Change & Water, NSW Office of Water, Industry & Investment NSW, Catchment Management Authority, Roads & Traffic Authority, Narrabri Shire Council, Gunnedah Shire Council and the Project team in attendance.

During September and October 2009, 25 near neighbours or landowners in close proximity to the Project were given the opportunity to participate in a personal Project briefing meeting. In total, nine landowners accepted a briefing as part of the stakeholder consultation program. A newsletter was also distributed to stakeholders to provide an update on the progress of the Project.

Issues raised by stakeholders are discussed in detail in the Environmental Assessment. These included: biodiversity, surface water, groundwater, traffic, noise and blasting, visual amenity, property devaluation, final land use and ecology.

During July 2010 a meeting was held with the nine landowners identified as being in the zone of acquisition because of potential noise impacts from the Project.

Engagement with the Aboriginal community occurred in accordance with the *Interim Community Consultation Requirements for Applicants* with six individual groups who registered an interest in the Project.

Boggabri Coal is committed to continuing its stakeholder engagement program throughout the life of the Project.

Ongoing stakeholder engagement will include regular contact with neighbouring land owners, representatives of key local and State regulatory authorities, industry bodies and the Aboriginal community and the release of public information on environmental performance.

IMPACT ASSESSMENT

A risk assessment was undertaken to identify potential environmental and social issues associated with the Project. The purpose of the risk assessment process was to prioritise and focus the required environmental assessments for the Project in consideration of the Director-General's Environmental Assessment Requirements and the findings from stakeholder engagement. Key findings from the environmental assessments undertaken as a consequence of the risk assessment are discussed below.

Air Quality

The air quality consultancy, PAEHolmes, completed an air quality and greenhouse gas assessment in accordance with the procedures outlined in the Department of Environment, Climate Change & Water's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

The assessment used a computer-based dispersion model (ISCMOD) to predict ground-level dust concentrations and deposition levels in the vicinity of the Project.

To assess the affect that dust emissions will have on existing air quality, the dispersion model predictions from the four indicative worst case modelled years (Year 1, Year 5, Year 10 and Year 21) have been compared with relevant air quality criteria.

Boggabri Coal's air quality monitoring program measures depositional dust at 15 sites and particulate matter less than 10 microns (PM_{10}) every six days at one site. A detailed review of monitoring data concluded that the existing annual average PM_{10} is currently less than relevant air quality criteria limits at private receivers.

The criteria for dust fallout levels is set by the Department of Environment, Climate Change & Water to protect against nuisance impacts and considers cumulative impacts from all dust sources.

The results from the dispersion modelling indicate that the Project, considered with other sources, is predicted to contribute to two receivers (not already in an existing zone of affectation) possibly experiencing exceedances of the air quality criteria in Year 5 of operation.

Boggabri Coal will review the existing Air Quality Management Plan for the site to incorporate additional practical management measures which may be implemented as required to ensure the predictions in this Environmental Assessment are met at private receivers. Boggabri Coal will install a Tapered Element Oscillating Microbalance air quality monitoring unit(s). Boggabri Coal will install a real time meteorological monitoring system with predictive software capabilities.

Greenhouse Gas

The procedure specified in the *National Greenhouse Accounts Factors* has been adopted for this assessment which is consistent with internationally applied methods. The main sources of greenhouse gas emissions from the Project have been identified as resulting from electricity consumption, fugitive emissions of Carbon Dioxide and Methane, diesel and explosives usage, transportation and the end use of the product coal.

When comparing emissions from the Project (16.94 Million tonnes of Carbon Dioxide equivalent per annum) with the estimated current global emissions (3,000 Giga tonnes of Carbon Dioxide equivalent per annum), it has been calculated that the average annual emissions of the Project from the mining, transport and burning of coal are estimated to be approximately 0.012% of the current global Carbon Dioxide emissions.

In this context it can be seen that the emissions estimated to result from the Project will not in themselves have any significant impact on global greenhouse gas emissions. Boggabri Coal, through its policies and procedures has committed to continue to undertake regular reviews and monitoring of greenhouse gas emissions.

Boggabri Coal will continue to implement energy efficiency initiatives to ensure that greenhouse gas emissions generated per tonne of product coal are kept to the minimum practicable level.

Noise

A noise impact assessment for the Project was completed by Bridges Acoustics in accordance with the *NSW Industrial Noise Policy* and other relevant guidelines. These included a comparison of predicted construction and operational mining noise, road noise and rail noise against relevant Department of Environment, Climate Change & Water criteria.

Predicted noise levels at receivers were calculated using the Renzo Tonin and Associates Environmental Noise Model which has been endorsed by Department of Environment, Climate Change & Water for environmental noise assessment.

The Project has been modelled for four worst case scenario years which include coal extraction at the extremities of the mine footprint and maximum production years. These being Year 1, Year 5, Year 10 and Year 21.

The Project is located in a quiet rural area. Monitoring had demonstrated that background levels regularly fall to 30 dBA or below. A background noise level of 30 dBA was adopted for all receivers and time periods in accordance with the *NSW Industrial Noise Policy*.

A 3°C per 100 metre temperature gradient with a 2 m/s wind from source to receiver is, according to the Roads & Traffic Authority Environmental Noise Model, equivalent to a very strong 8°C / 100 metre temperature inversion. This noise enhancing meteorological scenario was used to assess potential noise impacts.

Private receivers are predominantly influenced by activities associated with mining, transport of product coal or the Boggabri Coal Terminal, with the following key findings:

- Noise at 28 properties and owned by 14 different landowners is predicted to exceed the intrusive noise criterion by more than 5 dBA on occasion throughout the life of the Project; and
- Noise at 53 properties is predicted to exceed the intrusive criterion by less than 5 dBA which would be considered a minor to mild noise impact on these receivers, the majority of these properties are vacant land with no permanent residential dwellings or receivers.

Exceedances of relevant criteria were not predicted at any additional private receivers for sleep disturbance, road traffic noise or rail noise.

Boggabri Coal will install a real time noise monitoring system. The real time noise monitoring system will identify when noise enhancing conditions are occurring so that operations can be modified to achieve the relevant noise criteria.

A review of the existing Noise Management Plan will be undertaken for the Project. Boggabri Coal will continue to ensure that the predictions in the Environmental Assessment are met at private receivers through the implementation of required onsite management activities.

Blasting

A blast impact assessment for the Project was completed by Bridges Acoustics in accordance with Australian and New Zealand Environment Conservation Council Guidelines.

Current practice at Boggabri Coal commits to achieving relevant criteria at the closest receivers utilising available technology. This includes the modelling of representative blasts to predict impacts ensuring a reasonable level of certainty of impacts.

The assessment determined that blasting would produce up to 1.3 mm/s ground vibration at the nearest receiver and would remain well within the 10 mm/s criterion for the Project. Overpressure from blasting is predicted to remain below 120 dBL at the closest receiver.

The increase in production to 7 Million tonnes per annum will result in more frequent blasts rather than larger blast events enabling blasting impacts to be managed well within the limits of the relevant criteria. Blast events will continue to be coordinated with the existing Tarrawonga Mine and any other future mining operations in the area to avoid any potential cumulative impacts.

Visual and Lighting

Integral Landscape Architecture and Visual Planning completed a visual and lighting assessment of the potential impacts of the Project.

The assessment considered views to the Project from representative viewing locations to: the west along Therribri Road and the Kamilaroi Highway, the north along Harparary Road, the east on Goonbri Road and to the south along the Manilla Road and Boggabri township.

The assessment determined that receivers and roads to the north, east and west will not experience any visual impacts from the Project as they are well screened by the Willow Tree Range.

There will be a limited visual impact to receivers to the south-east and south-west of the Project however, no receiver will have a direct line of sight to the mining area due to the natural vegetation of the surrounding landscape screening from small hills and the natural topography.

There will be limited exposure of mining equipment while the overburden emplacement area is being constructed.

The active mining area will be screened behind the overburden emplacement area in the latter half of the Project. The Project will be visible from some locations on the Manilla Road. The progressive rehabilitation of the overburden emplacement area will minimise the visual impacts of the Project.

Train movements on the proposed rail spur across the Namoi River floodplain and the bridge over the Kamilaroi Highway will be visible to highway users travelling in a north and south direction.

The rail spur will be elevated above the Kamilaroi Highway. Interaction with highway traffic and visual impacts will be minimised through the rehabilitation of earthworks and the utilisation of colours that match the surrounding landscape.

Due to the natural screening of receivers and the existing mining operations in the vicinity of the Project Boundary there will be no significant impacts from direct or diffuse lighting during the life of the Project.

Mitigation and management measures to reduce the visual impacts from the Project include onsite treatments only. Offsite treatments at viewer locations are considered unnecessary.

Onsite mitigation measures will include designing and painting infrastructure in forest tones to blend in with the surrounding environment, progressive rehabilitation throughout the life of the Project and the direction of any lighting away from sensitive receivers.

Ecology

Parsons Brinckerhoff completed an ecological assessment for the Project in accordance with relevant guidelines. The ecological assessment describes the ecological values within the Project Boundary in consideration of the regional context in which it lies and assesses the impacts of the Project on flora and fauna, particularly Threatened species and communities listed under the *Threatened Species Conservation Act 1995*. The assessment also addresses impacts on Matters of National Environmental Significance as listed under the *Environment Protection and Biodiversity Conservation Act 1999*.

A background literature review confirmed that some fieldwork and scientifically robust surveys have been conducted at Boggabri Coal since its construction in 2006.

Following the review of existing information and survey findings, additional field surveys were undertaken from spring 2008 to autumn 2010 within the Project Boundary, Leard State Forest and proposed Biodiversity Offset Area. Aquatic studies were undertaken on the Namoi River at the site of the proposed rail spur bridge.

The Leard State Forest has been intensively logged for its timber resource on a regular basis. The surrounding landscape has been extensively cleared for agricultural activities.

Evidence of previous land uses are evident within the Leard State Forest including an extensive number of access tracks for logging purposes, the prominence of stumps and fallen timber and land clearing from forestry activities.

The predominant vegetated area within the Project Boundary is located within the Leard State Forest and includes open woodland and forest communities dominated by a variety of native trees and shrubs.

Outside of the Leard State Forest the predominant vegetation community is grassland, derived from clearing for agriculture. This vegetation community includes the presence of many exotic species typically associated with grazing lands.

A total of 427 species of plant were recorded within the Project Boundary. Three Endangered Ecological Communities as described under the *Environmental Biodiversity and Conservation Act 1999* and *Threatened Species Conservation Act* were identified within the Project Boundary: The Box-Gum Woodlands, Weeping Myall Woodlands and Natural Grasslands on Basalt Communities.

One additional Threatened Ecological Community listed under the *Fisheries Management Act* was identified within the Project Boundary.

Four flora species listed under the *Threatened Species Conservation Act 1995* and / or the *Environment Protection and Biodiversity Conservation Act 1999* are considered likely to occur within the Project Boundary. Two of these species were recorded within the Project Boundary, *Pultenaea setulosa,* listed under the *Environment Protection and Biodiversity Conservation Act 1999* and *Pomaderris queenslandica,* listed under the *Threatened Species Conservation Act 1995*.

A total of 194 fauna species have been recorded within the Project Boundary, including 6 amphibian, 129 bird, 31 mammal and 28 reptile species.

There are 33 fauna species listed under the *Threatened Species Conservation Act 1995* which are considered likely to occur within the Project Boundary. Of these, seven are listed under the *Environment Protection and Biodiversity Conservation Act 1999.*

Two species listed as Migratory under the *Environment Protection and Biodiversity Conservation Act 1999* have also been identified within the Project Boundary.

A total of 21 Threatened fauna species listed under environmental legislation were recorded within the Project Boundary.

This being; Little Eagle, Spotted Harrier, White-browed Woodswallow, Black-necked Stork, Brown Treecreeper, Black-chinned Honeyeater, Varied Sittella, Speckled Warbler, Diamond Firetail, Hooded Robin, Grey-crowned Babbler, Little Lorikeet, Turquoise Parrot, Barking Owl, Masked Owl, Yellow-bellied Sheathtail Bat, Koala, Eastern Bent-wing Bat, Eastern Cave Bat, Eastern False Pipistrelle and Little Pied Bat.

The area to be impacted over the life of the Project consists of approximately 1,385 hectares of native vegetation. This includes the proposed clearance of 624 hectares of Box-Gum Woodland which is listed under the *Environment Protection and Biodiversity Conservation Act 1999* and *Threatened Species Conservation Act 1995*.

The clearance of vegetation required for the Project will directly remove habitat for a range of Threatened fauna species. Remnant patches of native vegetation within the surrounding Leard State Forest will remain with actual and potential habitat for these species and thus, viable local populations are anticipated to exist in the long term.

Assessments of Significance for those listed Threatened species relevant to the Project have been completed. In the absence of mitigation or compensatory management measures, mining of the Leard State Forest would have a significant impact upon the *Environment Protection and Biodiversity Conservation Act 1999 and Threatened Species Conservation Act 1995* listed Box-Gum Woodland and some Threatened flora and fauna species.

In the short term, the Project will increase the degree of fragmentation of treed habitats within the landscape of the Leard State Forest which will also result in the temporary removal of tree hollows, which are a wildlife resource used by a number of Threatened bats and birds. Management measures proposed for the Project have followed the Department of Environment, Climate Change & Water policy for assessing the ecological impacts of proposed developments, with the aim to avoid, mitigate or offset all identified impacts.

In particular Boggabri Coal has developed a Biodiversity Offset Strategy to mitigate and offset the ecological impacts arising from the Project. The Boggabri Coal Biodiversity Offset Strategy addresses the impacts predicted for the Project by providing Offset Areas. The strategy provides a holistic approach to biodiversity management at Boggabri Coal by incorporating a regional approach to identifying appropriate offset sites and commitments required to mitigate the impacts resulting from the Project.

The Boggabri Coal Biodiversity Offset Strategy has specifically been developed to integrate the proposed Offset Areas with local and regional vegetation corridors, existing Conservation Areas and other proposed and established Offset Areas.

The Offset Strategy was developed in consultation with the Boggabri Coal Biodiversity Offset Strategy Working Group which was established by the Department of Planning to facilitate the development of appropriate offsets for the Project.

The Boggabri Coal Biodiversity Offset Strategy recognises the *Brigalow and Nandewar Community Conservation Area Act 2005* which set aside more than 350,000 hectares of native vegetation communities for conservation in the Brigalow and Nandewar bioregions. The Leard State Forest is identified as Zone 4 which is dedicated for the purpose of forestry, recreation and mineral extraction.

Boggabri Coal is committed to providing additional conservation areas as offsets to compliment the Zone 1 and Zone 2 conservation areas set aside in the *Brigalow and Nandewar Community Conservation Area Act 2005.* The strategic corridor properties are located to ensure connectivity and to provide linkages to surrounding native vegetation.

The Proposed Offset Areas are generally consistent with the principles for offsets developed by the Commonwealth and State. The Proposed Offset Strategy aims to improve and maintain the ecological condition of the landscape within the locality.

It will achieve this through conserving, improving and creating woodland and forest communities, including habitat for Threatened species, such that the net area of vegetation communities and the condition of habitats increases over time.

The new Proposed Offset Areas for the Project will be provided through the protection and enhancement of land outside the Project Boundary. Further to the Proposed Offset Areas, approximately 1,835 hectares of rehabilitated land will be returned to native woodland and forest after mining.

Connectivity of the proposed Offset Areas and the existing Conservation Areas will be provided for in the long term through the creation of Regional East-West Wildlife Corridor comprising existing and proposed woodland areas.

The proposed Offset Area aims to provide vegetation and habitat corridors to the Leard State Forest, Leard State Conservation Area and Nandewar Range. This would further enhance the proposed Boggabri Coal Biodiversity Offset Strategy on a regional level and complement other local biodiversity conservation efforts.

A management plan will be prepared to guide the long term management of flora and fauna within the proposed Offset Areas and ensure the development and implementation of a scientifically based process for the re-establishment of the White Box Yellow Box Blakely's Red Gum Woodland on Boggabri Coal's rehabilitation.

Other specific mitigation measures to be implemented for the Project to ensure the ongoing viability of Threatened flora and fauna species and communities within the Project Boundary include:

- Revision and consolidation of the existing Flora and Fauna Management Plans to include the Project and proposed Offset Strategy;
- The continuation of flora and fauna monitoring in accordance with the Boggabri Coal Environmental Management Plan to provide ongoing feedback about the condition of vegetation and habitat values across the Project Boundary;
- Establishing nest boxes, where necessary, to maintain effective fauna habitat at Boggabri Coal;
- Continue to complete pre-clearance surveys within areas to be cleared and where possible, translocate detected Threatened flora and fauna into protected habitat; and
- Investigate alternative mining methods on the boundary with adjacent mining operations to ensure a Regional East-West Wildlife Corridor is maintained in the Leard State Forest.

With the implementation of these measures, in conjunction with the proposed Biodiversity Offset Strategy for the Project, it is believed that habitat for Threatened flora and fauna in the Project Boundary will remain viable in the long term and at a minimum maintain the biodiversity conservation value of the region.

Aboriginal Heritage

Insite Heritage prepared an Aboriginal archaeology and cultural heritage impact assessment for the Project. This has reviewed and assessed the nature of the archaeological landscape of the Project Boundary, and the potential impacts that the Project may have.

A total of 77 archaeological sites were identified during the field survey of which 29 were isolated finds, 34 open artefact scatters and 14 scarred trees.

These results are largely consistent with results from previous surveys in both the Project Boundary and the wider Namoi Valley region. The continuation of mining operations proposed as part of the Project will impact up to 23 open artefact scatters, 28 isolated finds and up to 12 scarred trees.

Boggabri Coal is committed to the construction of an Aboriginal Cultural Heritage keeping place for the purpose of protecting Aboriginal cultural heritage objects. Any relocations of scarred trees will be undertaken in consultation with the local Aboriginal stakeholder groups.

The salvage and the protection of any remaining Aboriginal objects within the Project Boundary will continue to be managed in accordance with a revised Aboriginal Archaeology and Cultural Heritage Management Plan.

This plan will be developed in consultation with the local Aboriginal community and Department of Environment Climate Change & Water in accordance with the relevant guidelines.

It should be noted that the *Brigalow and Nandewar Community Conservation Area Act 2005* set aside significant areas of land for use by Aboriginal people and the protection of Aboriginal archaeology, essentially as an Offset Area for areas such as Leard State Forest that have known forestry and coal resources.

Non Aboriginal Heritage

An assessment was undertaken by Archaeology Australia to determine the potential impacts of the Project on Non Aboriginal heritage items in accordance with relevant NSW Heritage Guidelines.

The assessment included historical and archival research and searches of the relevant Commonwealth and State heritage lists, a review of previous heritage assessments and a field survey.

A total of 12 sites were identified during the assessment with a potential eight sites to be impacted by the Project.

There were no sites identified within the Project Boundary as having high historical value.

The Heathcliff property was identified as having high research potential and will be further assessed prior to its demolition.

The cemetery at 'the Rock' property was identified as the only highly significant Non Aboriginal heritage site. It is located outside of the Project Boundary and will not be impacted by the Project.

Boggabri Coal owns this property and will manage the cemetery in accordance with the Non Aboriginal Heritage Management Plan developed for the conservation and management of these sites.

Surface Water

A surface water impact assessment was undertaken by Parsons Brinckerhoff which included a site water balance, water sourcing assessment and a discussion on impacts to water resources including water users and riparian vegetation in the vicinity of the Project.

Boggabri Coal's water management system prescribes the process relied upon to effectively source, capture, divert, store, monitor, utilise and reticulate water onsite. It is based on adherence to well-established, best water management practices in the Australian mining industry. Boggabri Coal has a monitoring program in place with water quality monitored at numerous sites, including local creeks and mine water dams.

A multi-year dynamic water balance model was developed for the Project based on a deterministic single year water balance model.

The model simulates all inflows, outflows, transfers and changes in storage of water onsite on a daily continuous basis. Calculated demand for the Project reaches a maximum 1,309 Megalitres in Year 5 with the construction and operation of a Coal Preparation Plant. The water balance assessment has identified that Boggabri Coal will have a water deficit in Year 5 of up to 750 Megalitres in extreme drought conditions which will decrease to approximately 361 Megalitres by Year 10.

A water sourcing assessment was undertaken to identify potential surface water and groundwater availability in the Namoi Valley.

Water access licenses with a total share volume of 3,498 Megalitres of high security water is available under the *Water Sharing Plan of the Upper Namoi and Lower Namoi Regulated Rivers Water Sources 2003*.

Over the last five years high security water has always been allocated at 100% of entitlement. A total volume of up to 18,054 Megalitres has been traded over the past five years including high security water access licences in this market. Sixty seven percent of the total volume of access licenses traded were regulated river general security water access licences.

The water deficit is predominantly a result of the operation of the Coal Preparation Plant which requires increased water demand. The water deficit is significantly reduced without the operation of the Coal Preparation Plant. Approximately 30% of coal is required to be washed and mining can continue without the washery for short periods.

The water balance deficit can be largely managed by the adjustment in use of the washery.

Boggabri Coal has been actively pursuing the acquisition of additional water entitlements on the open market since June 2010. Boggabri Coal is currently in discussion with a number of water title holders over the purchase of an additional 400 ML of groundwater. It is anticipated that this additional water allocation will be acquired in 2011.

Further to this, Boggabri Coal has submitted an application for a groundwater interference licence with the NSW Office of Water for an additional 400 ML of deep hard rock aquifer water. Boggabri Coal's total groundwater allocation is expected to reach approximately 1,114 ML by Year 5 of the Project. This will provide adequate water to operate the mine at maximum production in extreme dry years.

The availability of high security water on the trading market and the control over any water deficit through the management of the washery provides sufficient options available to effectively manage any potential water deficit.

Boggabri Coal will not require to discharge mine water into the Nagero Creek or Namoi River under normal operating circumstances. All dirty water and contaminated water will be captured and stored onsite for dust suppression and use in the washery.

Surface water will continue to be managed in accordance with the existing site Water Management Plan which will be reviewed as needed to ensure that it meets the changing requirements of the Project.

The 1 in 100 year flood level reaches a maximum height of 239.6 metres Australian Height Datum approximately four metres above the existing floodplain which is consistent with evidence from the 1955 flood.

The mining area, proposed washery and associated infrastructure is located at approximately 270 metres Australian Height Datum well above the 1 in 100 year flood level. The existing private coal haul road will be inundated during the 20 year average reoccurrence interval design flood event. The proposed rail spur will be constructed so as the track base is above the 1 in 100 year flood event level.

Flood assessment modelling has confirmed that the construction of mine related infrastructure on the floodplain, including the rail bridge across the Namoi River, will have no significant adverse impacts on water levels or river bank erosion upstream or downstream of the Project Boundary.

Groundwater

A groundwater impact assessment was undertaken by Australasian Groundwater and Environmental Consultants. Three aquifer systems exist in the region: alluvial aquifer associated with the Namoi River floodplain and tributaries; weathered bedrock near the ground surface; and the coal seams of the Permian Maules Creek Formation.

A search of the NSW Office of Water database of registered bores and wells indicates that there are 143 registered bores within a 5 kilometre radius of the Project Boundary. A total of 68 registered bores are located on land owned by Boggabri Coal and other mining companies. There were 28 registered bores identified within the zone of influence of the Project. The majority of which are licensed monitoring bores.

The NSW Office of Water database indicates that those bores to be impacted by the depressurisation of the coal seam aquifers are located on Boggabri Coal owned land or other Mining Company owned land. There are no private registered bores within the predicted zone of influence for the Project. There are no registered bores constructed in the Namoi Valley alluvial aquifer within the predicted zone of influence.

The groundwater assessment utilised a three-dimensional transient, groundwater flow model (MODFLOW SURFACT) for the area that was developed to provide predictive simulations of the impact of the Project on the groundwater regime.

Previous open cut mining in the area has led to the cumulative depressurisation of the coal seams and water bearing layers in the interburden in and surrounding the Project Boundary and a subsequent drawdown in the piezometric surface / water table up to 2 kilometres from the existing Boggabri Coal mining void. This observation is consistent with previous numerical modelling of the area.

The Boggabri Volcanics are a very low permeable igneous rock formation which underlines the Namoi Valley Alluvial aquifer system.

As such the zone of depressurisation from existing mining operations or the Project does not impact on water levels in the Namoi Valley alluvial aquifer. Modelling demonstrates that the cones of depression from the existing Tarrawonga Mine and Boggabri Coal Mine are interacting. The zone of influence will migrate to the Boundary of the Namoi Valley alluvial aquifer to the south relatively quickly within the first five years of the Project. The higher recharge rate from slope wash runoff and the Boggabri Volcanics prevents further propagation of the zone of influence.

The groundwater simulation indicates that the maximum void inflow rate of brackish water from the Permian coal seam aquifers will be 1 Megalitre per day by Year 21 of the Project.

Investigations undertaken for the Project have confirmed that a narrow band of alluvium exists along Nagero Creek. The stratigraphic sequence of this alluvium is generally consistent with that of the Namoi River alluvium, suggesting a possibility of hydraulic interconnection.

Groundwater from the Namoi River alluvial aquifer is expected to increase to a maximum void inflow rate of 0.2 Megalitres per day by Year 21. Groundwater inflow decreases over time post mining as the mining void and adjacent aquifers recharge.

Rainfall and groundwater seepage will slowly fill the final void and will take approximately 15 to 20 years to reach an equilibrium level. Assuming that the final void is backfilled to RL 285 it is predicted that the groundwater level within the final void will stabilise at about RL 283 metres. This is consistent with the pre-mining groundwater levels. Therefore a stable groundwater environment will be created and the final void will not act as a permanent sink for groundwater.

The Project is also predicted to result in the reduction in the rate of the groundwater flow from the Permian coal seam aquifers to the base of the Namoi Valley alluvial aquifer.

This reduction in water level in the alluvial aquifer is predicted to be less than one meter which will be undetectable from seasonal cycles. Additional monitoring piezometers will be installed to monitor depressurisation and groundwater quality as required.

Boggabri Coal will continue to monitor hydro-geomorphological conditions and in the unlikely event of water levels in existing landholder bores declining as a consequence of the Project will consult with the landholder to mitigate potential further impacts and agree compensation arrangements.

A revision to the existing Water Management Plan to incorporate the Project will be undertaken, to ensure that it meets the changing requirements of the Project.

Economics

An economics assessment was undertaken by Gillespie Economics which determined the costs and benefits of the Project. The benefit cost analysis compared the Project (i.e. the continuation of Boggabri Coal Mine for a further 21 years at up to 7 Million tonnes per annum product coal) to the base case (i.e. cessation of mining in November 2011).

The Project represents a quantified net benefit of approximately $1,362 Million (although this excludes some external environmental impacts of the Project which cannot be quantified, and the economic and social benefits of employment provided by the Project which also have not been quantified) and should be considered as a minimum threshold value.

As such, the unquantified environmental impacts of the Project, after mitigation by Boggabri Coal, would need to be valued at greater than this amount to make the Project questionable from an economic perspective.

Input-Output tables were used to estimate the total contributions to the Regional and State economy, with the following results:

- Regional economy benefits:
    - $819 Million in annual direct and indirect regional output or business turnover;
    - $360 Million in annual direct and indirect regional value added;
    - $120 Million in annual household income; and
    - 1,171 direct and indirect jobs.
- State economy benefits:
    - $1,527 Million in annual direct and indirect output or business turnover;
    - $689 Million in annual direct and indirect value added;
    - $315 Million in annual household income; and
    - 3,675 direct and indirect jobs.

Social

Hansen Bailey completed a social impact assessment for the Project which reports that Boggabri Coal's employees tend to live in the townships of Gunnedah, Narrabri and Boggabri. Both the Narrabri and Gunnedah Local Government Areas have experienced declining population growth between 2001 and 2006 Census periods.

Despite the decreasing trend in population growth of both the Narrabri and Gunnedah Local Government Areas the economy has continued to grow across the region. The Narrabri Local Government Area has had several coal mining operations recently commence, a new supermarket developed and additional accommodation facilities constructed.

Population impacts are likely to be experienced in Narrabri and Gunnedah, with the Project-specific peak workforce influx likely to result in approximately 638 new community members moving to the local area.

The Project includes the upgrading of existing infrastructure over an extended construction period. Combined with the incremental increase in production this will result in a gradual increase of new families relocating to the region.

This will afford local communities and service providers the opportunity to adjust and improve current capacities where required to manage the changing demands of population growth.

It is unlikely that there will be any cumulative construction workforce impacts for the region, particularly on key service sectors such as the temporary accommodation sector.

The social impact assessment examined the cumulative impact from Boggabri Coal and Tarrawonga Mine at their peak operational phases.

Boggabri Coal's peak production phase is likely to commence in 2016. The Tarrawonga Mine planning approval expires in 2017 and is not expected to be operating with a full production workforce at this time. This time lag is likely to afford key service providers in the Narrabri and Gunnedah Local Government Areas the opportunity to work constructively with the respective companies in effectively planning for the potential fluctuations in population growth in coming years.

Boggabri Coal has been operating since 2006 and has an established presence within the Narrabri Local Government Area with an open, two way communication program of community engagement which will continue to provide further information on issues of interest to the community.

Boggabri Coal has put in place a voluntary planning agreement with the Narrabri Shire Council, commensurate with the impacts of the Project. This agreement recognises the need to improve amenities and road infrastructure in the immediate vicinity of the mine.

The voluntary planning agreement includes a commitment of up to $9.67 Million to cover the costs for community infrastructure works including:

- Upgrades to the Boggabri Caravan Park and swimming pool;
- Erection of a monument in Boggabri in recognition of the achievements of Ben Lexcen;
- Improved public seating throughout Boggabri;
- Support for the Boggabri Home and Community Care organisation; and
- Upgrades to Harparary Road and Bridge over the Namoi River.

It is hoped that this investment in the local area will encourage Boggabri employees to reside in Boggabri.

Waste

Boggabri Coal has an existing Waste Management System which was developed to consolidate the disposal, tracking and reporting of all waste generated onsite including general waste, recycling and workshop waste.

Boggabri Coal has documented procedures for the minimisation, storage, transport, disposal, tracking and reporting of waste generated onsite. A spill response procedure is also in place that describes the measures to be followed in the event of a spill incident.

The current Waste Management System will continue to be utilised for the Project with the Sewerage Treatment Plant upgraded and or duplicated as required.

Soils and Land Resources

GSS Environmental completed a soils and land use assessment for the Project which determined that soil types within the Project Boundary include subsoil horizons which exhibit a moderate to high potential for dispersion which will be managed to ensure that the subsoils are not exposed without suitable controls being implemented.

The potential for acid generation from regolith material (topsoil and subsoil) within the Project Boundary is low.

A determination of pre-mining and post-mining agricultural suitability found that the majority of land within the Project Boundary consists of Class IV and Class V land covering an area of approximately 1,164 hectares and 990 hectares respectively.

Best practice management measures will continue to be undertaken at Boggabri Coal to reduce the potential for degradation during mine rehabilitation to achieve the desired post-mining land capability, agricultural suitability and biodiversity.

Rehabilitation and Final Landform

Boggabri Coal has commenced rehabilitation trials to assist in refining its techniques and further define the most appropriate success criteria for the Project.

Boggabri Coal is committed to progressive rehabilitation and monitoring to improve biodiversity and establish suitable habitat for Threatened species.

Sufficient coal reserves exist within Boggabri Coal's mining and exploration leases to enable coal mining beyond Year 21 of the Project by open cut method pending the granting of future Planning Approvals for a further seven years.

In the unlikely event that mining does cease at Boggabri Coal in Year 21, a strategy has been developed to ensure the minimisation of mine void areas and the creation of an acceptable post mining landform. This includes a Conceptual Final Landform which has been developed for the Project that aims to link existing vegetation communities within and surrounding the Project Boundary with rehabilitation areas to provide corridors for the movement of fauna. The translocation of topsoil and vegetative material containing an appropriate seed bank to rehabilitation areas will be undertaken to assist in the recreation of Box-Gum Woodland understorey.

Hazard Analysis

A review of the relevant components of the Project has confirmed that the Project is not considered to be Potentially Hazardous or Offensive.

As such, a detailed preliminary hazardous analysis is not required. All hazardous materials associated with the Project will continue to be transported by a licensed contractor in accordance with the relevant Australian Standard and legislation. Boggabri Coal will continue to utilise its Environmental Management Programs and Occupational Health and Safety procedures to manage the hazards and risks associated with the Project.

Traffic and Transport

A traffic impact assessment was undertaken for the Project by Parsons Brinkerhoff in accordance with the *Guide to Traffic Generating Developments*.

The main vehicular road access to the Project is via the Manilla Road and Leard Forest Road which is located east of the Kamilaroi Highway, however there are a number of alternative accesses used to access other areas of the site.

Leard Forest Road connects to the Manilla Road (in the south) and the Harparary Road (in the north) and is a low trafficked unsealed road carrying predominantly mining and rural related traffic.

The traffic impact assessment included a review of traffic data available from Narrabri Shire Council, Roads & Traffic Authority and actual traffic count data for the purpose of this assessment.

Intersection performance was also assessed as part of the study using traffic modelling software SIDRA to identify potential adverse impacts from construction and mining related traffic from the Project.

Level of service is a qualitative measure of the operational conditions within a traffic stream as perceived by motorists and passengers and was assessed for predominant intersections in relation to Project impacts. The full operation of the Project in Year 5 will not cause any significant change to the level of service experienced by road users.

The Project will require the closure of a section of Leard Forest Road as mining progresses to the north. Leard Forest Road will remain accessible from the Manilla Road (to the south) and Harparary Road (to the north).

The traffic study found that the closure of a section of Leard Forest Road will have no significant adverse impact on the safety or capacity of the adjoining road network for the community. The study identified that the majority of traffic users on Leard Forest Road during peak traffic periods for the Project were related to mining activities. There were few traffic users during these times that used Leard Forest Road for other purposes.

It is recognised that there will be some inconvenience to a small number of individual local residents who use Leard Forest Road on a regular basis. Travel time from Maules Creek to the Leard Forest Road / Manilla Road intersection would increase by 6 minutes and add an additional 6.7 kilometres of travel.

Maules Creek residents indicated that they use Leard Forest Road to access their properties during times of flood when Harparary Road is impassable.

Boggabri Coal has included as part of its Voluntary Planning Agreement with the Narrabri Shire Council to upgrade Harparary Road including installing a bridge over the Namoi River so as the community has access to the Kamilaroi Highway from Maules Creek during flood events.

It is recognised that the proposed upgrade of Harparary Road and the installation of a bridge over the Namoi River will provide significant benefits to the local community and the wider region.

Temporary road closures required for safety purposes where blasting occurs within 500 metres of Leard Forest Road will be undertaken in accordance with the Boggabri Coal Road Closure Management Plan.

Train movements will not impact traffic flow on the local road network adjacent to the Project Boundary as the rail spur will be constructed with bridges spanning Therribri Road, the Namoi River and Kamilaroi Highway. A traffic impact assessment was completed for the at grade rail crossings in Boggabri, Gunnedah and Curlewis. At full production the Project will require between two and three trains per day (5.5 train movements per day). Each train movement will delay traffic by approximately 8 minutes.

The Australian Rail Track Corporation is proposing to upgrade the rail network by 2015 which will enable an increase in the length and capacity of trains, therefore reducing the number of trains required for the Project. The increase train length will add 30 seconds to current waiting times for traffic. The average queue length at the level crossings in Boggabri and Gunnedah would increase by up to 3 vehicles in each direction and up to 16 vehicles in each direction in Curlewis on the Kamilaroi Highway.

The study found that the road networks at each of the crossings have sufficient capacity to accommodate the additional queue length and the congestion at all crossings would be minor.

Leard State Forest

The Leard State Forest is managed by Forests NSW. Boggabri Coal has established an access and compensation agreement to allow mining activities in the Leard State Forest.

Boggabri Coal provides all cleared timber to Forests NSW commensurate with the agreement. Boggabri Coal has further identified an area outside of the Leard State Forest as part of its Offset Strategy that is suitable to be planted as a commercial timber plantation. It is anticipated that the Leard State forest will continue to be accessed for forestry activities post mining.

Recreational users will continue to be able to access sections of the Leard State Forest from the north via the remaining open section of Leard Forest Road.

WORST CASE CUMULATIVE ASSESSMENT

The Environmental Assessment has cumulatively considered approved projects (and those currently being assessed by the Department of Planning) in the vicinity of Boggabri Coal Mine.

Additionally, Boggabri Coal has undertaken a Simultaneous Worst Case Cumulative Impact Scenario review. This has been undertaken to gain a high level appreciation of the potential worst case cumulative impacts if other known mining authorities were to be progressed to Project Approval during the life of Boggabri Coal Mine.

The appreciation is necessarily high level and based upon some highly speculative assumptions which are detailed in the individual Simultaneous Worst Case Cumulative Impact Scenario review reports. The Other Projects considered in the Simultaneous Worst Case Cumulative Impact Scenario review included the:

- Tarrawonga Modification;
- Maules Creek Coal Project;
- Tarrawonga Extension; and
- Goonbri Project.

The Tarrawonga Modification Environmental Assessment was put on public display in April 2010. The Tarrawonga Modification has been considered in the environmental assessments for the Project.

The Maules Creek Coal Project submitted a referral under the *Environmental Planning and Assessment Act 1979* in July 2010 accompanied by a supporting Preliminary Environmental Assessment. An advertisement for the Project Application was published in local newspapers on 19 August 2010. The Maules Creek Coal Project is currently preparing an Environmental Assessment.

It is possible that Tarrawonga Coal Mine will be expanded further into Exploration Lease 5967 (Tarrawonga Extension), whether by new project approval or further modification of the existing approvals. There have been no approvals issued or applications made for this proposal to date that are publically available. All that is known of this proposal at this time is the existence of Exploration Lease 5967. As such, a project description is not available.

It is possible that a future open cut or underground coal mine will be developed within Exploration Lease 7435 under a new project approval which may be made at some time in the future (Goonbri Project).

There have been no approvals issued or applications made for this proposal to date that are publically available. All that is known of this proposal at this time is the existence of Exploration Lease 7435. As such, a project description is not available.

A summary of the findings from the Simultaneous Worst Cast Cumulative Impact Scenario is included below.

Air Quality

There is potential for additional cumulative impacts to occur on properties to the south of the Project due to the combined impacts of the Other Projects.

Due to the minimal winds from the east, there is limited potential for any significant cumulative impacts to properties to the west of Boggabri Coal Mine and Maules Creek Coal Project by the Goonbri Project.

Any additional dust emissions from the Tarrawonga Extension and / or the Goonbri Project could potentially result in cumulative impacts to properties to the south-east of Boggabri Coal. This is due to the prevalence of winds from the north and west (most evident in spring and winter).

The Maules Creek Project, Tarrawonga Extension and / or the Goonbri Project could potentially result in cumulative impacts to properties to the north-west of the Project. This is due to predominant winds from the east and south (most evident in summer and autumn).

Noise

The Simultaneous Worst Cast Cumulative Impact Scenario for noise indicates that all properties remaining outside the zone of affectation for each separate mining operation are unlikely to be subjected to cumulative noise impacts from two or more coal mining projects. The cumulative noise from two or more coal mines is therefore unlikely to cause significant noise impacts at any privately owned property that will not be within a zone of affectation.

Ecology

The proposed projects considered for the Simultaneous Worst Case Cumulative Impact Scenario are all largely located within or adjoining Leard State Forest, which comprises a large remnant patch of vegetation surrounded by a landscape that has been significantly affected by past land uses. The Leard State Forest has been intensively logged for its valuable timber resources on a regular basis up until the early 1980s.

These activities have affected the quality and diversity of habitats for locally occurring Threatened species and it is likely that in the absence of future mining projects, these activities would continue throughout the Forest as productive timber develops.

Despite the impacts of past forestry operations within the Leard State Forest and in the absence of any amelioration works or offset areas, the cumulative impacts of the Other Projects would have a substantial impact on the ecology of the local area.

They would remove nearly 2,981 ha of native vegetation within or adjoining Leard State Forest and as much as 5,067 ha if including the potential development of the Goonbri Project and Tarrawonga Extension (yet to be defined).

In accordance with current regulatory requirements and policies from the Department of Planning and Department of Environment, Climate Change and Water any future mining projects in the area would likely be required to set aside biodiversity offsets as compensation for the impacts identified with each project.

If the expectations for offsets for the Other Projects are similar to that of the Project then the contribution of these projects to additional biodiversity offsets may encompass up to approximately 18,155 ha at an average ratio of 5:1.

If the combination of existing and potential future biodiversity offset strategies for each project were to complement each other, then the long term biodiversity of the region could potentially be improved. This would also provide the opportunity for larger contiguous parcels of land to be placed under long term conservation management strategies in perpetuity.

The Leard State Forest currently has no such protection and in fact is zoned under the *Brigalow and Nandewar Community Conservation Area Act (2005)* for ongoing forestry and mining activities.

Groundwater

The Simultaneous Worst Case Cumulative Impact Scenario review of groundwater identified that interactions between the zone of depressurisation of the Maules Creek Coal Project and the Tarrawonga Modification will occur.

The modelling indicates depressurisation would extend under the alluvial aquifers to the north of the Maules Creek Coal Project and to the south of the Tarrawonga Mine outcrop area. However, the resultant drawdown in groundwater levels in the alluvial aquifers would be less than one meter and therefore unlikely to be detectable from seasonal fluctuations.

The net volume of groundwater flowing from the Permian bedrock aquifer (Boggabri volcanic and Permian coal measures) into the overlying alluvial aquifer would be reduced. The modelling indicates that in the absence of mining, the natural net seepage rate from the bedrock aquifer to the alluvial aquifer is about 1.25 ML/day. It is estimated in the Simultaneous Worst Case Cumulative Impact Scenario at Year 21 of the Boggabri Project, this natural seepage would reduce by about 0.35 ML/day (from 1.25 ML/day to 0.9 ML/day).

This reduction in natural seepage would result in a drawdown in the alluvial aquifer which would be less than one meter and therefore unlikely to be detectable from seasonal fluctuations.

The model assumed a hydraulic connection between the alluvial aquifer and the Permian bedrock aquifer based on evidence from existing monitoring data. A reduction in the yield from the alluvial aquifer and Permian bedrock aquifer would be unlikely to impact on neighbouring landholder bores and is therefore not considered to be a significant impact.

The Simultaneous Worst Case Cumulative Impact Scenario modelling indicates that the zone of depressurisation at 100 years after mining ceases would be larger than that predicted for the 21 year active mining period for the Project. This is predominantly due to the evaporation from the ponded groundwater in the Maules Creek Coal Project final void. Evaporation from the Maules Creek Coal Project final void will act as an evaporative sink removing groundwater from the Permian bedrock aquifer. This will allow the zone of depressurisation to slowly increase in area over time.

The zone of depressurisation will reach a maximum extent at the interface between the outcropping Permian bedrock aquifer and alluvial aquifer. The higher recharge rate of the alluvial aquifer will prevent the further progression of the zone of depressurisation in the Permian bedrock aquifer.

The long term reduction in groundwater levels in the alluvial aquifer is predicted to be less than one meter and therefore the yields from bores constructed in this zone are not expected to be impacted in the long term.

Surface Water

The Project is largely located within the Nagero Creek catchment. The Simultaneous Worst Case Cumulative Impact Scenario would potentially capture runoff from an additional 170 ha of the Nagero Creek catchment, further reducing runoff volumes to Nagero Creek. The combined area captured in water management systems of coal mines within the Nagero Creek catchment would be approximately 1,803 ha (22.5% of the total catchment a 2.1% increase).

A sensitivity analysis was undertaken to assess the response of the Boggabri Coal Mine water balance to changes in groundwater make from the mining void.

In the absence of data from groundwater modelling incorporating the Simultaneous Worst Case Cumulative Impact Scenario, nominal groundwater make reductions of 10% and 20% were adopted for the sensitivity analysis.

For a nominal 20% (worst case) reduction in groundwater make, the outstanding water deficit during Year 5 would increase by 50 ML. This is not considered a significant volume and would not change any of the findings in the surface water assessment for the Project.

There is unlikely to be any adverse cumulative impacts associated with water quality on the Namoi River from mining activities.

Road and Rail Traffic

The Simultaneous Worst Case Cumulative Impact Scenario would be unlikely to have any significant impact on the performance or safety of the local road network.

The traffic performance of all the key intersections would remain excellent. The worst performing would be the Leard Forest Road / Boggabri Mine Access Road intersection (which is a private access) with a degree of saturation of 0.3 and a level of service B in both the AM and PM peak hour periods.

No public transport services were identified in the vicinity of the Project that would be adversely impacted by the simultaneous operation of the Other Projects.

The Simultaneous Worst Case Cumulative Impact Scenario for traffic at studied level crossings on the Mungindi to Werris Creek Railway in Boggabri, Gunnedah and Curlewis would not be significant. The increase in the number of trains, from an average of 1.2 coal train trips per day to transport 1.5 Million tonnes per annum of coal from the existing Boggabri Coal Mine up to 13.6 coal train trips per day to service the estimated 22 Million tonnes per annum from the Other Projects would increase the daily delay to traffic at these crossings.

However, because existing traffic volumes are low and coal trains often run over night when traffic volumes are lower still, the impact of the increase in trains is likely to be small.

It is acknowledged that some road users may notice additional delays at level crossings due to an increase in rail movements. It should be noted that the capacity of the road network at low level crossings to accommodate traffic cues from additional assessed rail movements is sufficient.

JUSTIFICATION

Boggabri Coal Mine is an existing mining development, which has successfully operated since 2006 under its original planning approval. On this basis, it is recognised that the Project represents the continuation of previously anticipated mining to ensure the total extraction of all economically viable open cut coal reserves within the current Mining Lease and Authorisation area as the mine progresses further to the north.

The Project is a natural progression of the intended land use which will initially utilise the existing employee resource, infrastructure and equipment fleet in operation at the mine prior to its supplementation.

Whilst allowing current mining operations to progress in an orderly manner, the Project will provide the mine the flexibility to increase its coal production rate in response to international energy and metallurgical coal demands.

The fact that the foundation elements of required infrastructure are in place and the open cut mining area is partially disturbed, results in a substantial amount of the Project impacts having been previously incurred thus lessening the impact of the natural progression of the mine.

The Project Boundary is located between two previously approved mining operations; the Tarrawonga Mine to the south and the Maules Creek project to the north-west.

The area has been identified as containing a valuable coal resource and is recognised as Zone 4 under the *Brigalow & Nandewar Community Conservation Area Act 2005* which dedicates the area as State Forest for the purposes of forestry, recreation and mineral extraction.

The other flexibilities sought by this Project will ensure that Boggabri Coal can effectively handle and process product coal and respond to market demands ensuring Boggabri Coal's competitiveness and therefore longevity.

The conceptual mine plan presented for the Project has been specifically designed to support the economic productivity of the Project within the constraints of the mine site, whilst complying with all relevant environmental criteria presented in the Environmental Assessment. As such the Project will deliver significant socio-economic benefits to both the Narrabri and Gunnedah Regions and the State of NSW more generally through the generation of additional employment, export revenue, taxes and royalties.

The Voluntary Planning Agreement reached with Narrabri Shire Council will provide substantial funds to address the increased impacts on any local community infrastructure associated with the Project. In particular the immediate local community will benefit substantially from the proposed investment in the local road network and within the township of Boggabri.

The application of a stringent, contemporary Environmental Assessment has not identified any significant adverse economic, social or environmental impacts associated with the Project apart from that of the impact on the current ecological value of the Leard State Forest which has previously been zoned for forestry, recreation and mineral extraction purposes.

The Project involves the continuation of mining operations at the Boggabri Coal Mine through a mine plan which has been specifically designed to minimise adverse economic, social and environmental impacts, optimise the final landform outcome and end land use and provide suitable offsets.

Boggabri Coal is proposing to implement a Biodiversity Offset Strategy on its existing and potential future landholdings which will include the conservation of existing remnant vegetation and the revegetation of previously cleared land. Further to this Boggabri Coal is committed to dedicating strategically located properties which are of high ecological value as biodiversity offsets for the Project to create a Regional East-West Wildlife Corridor.

Due to the substantive positive economic and social impacts associated with the Project and the nature of the environmental impacts resulting from the Project (in consideration of the mitigative measures proposed) it can be concluded that the Project is well justified on economic, social and environmental grounds. Based upon the findings in the Environmental Assessment the Project is consistent with the objects of the *Environmental Planning Assessment Act 1979*.

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1 BACKGROUND

1.1 INTRODUCTION

Boggabri Coal Pty Limited (Boggabri Coal) is a wholly owned subsidiary of Idemitsu Australia Resources Pty Limited (IAR) which operates the Boggabri Coal Mine. IAR is 100% owned by Idemitsu Kosan Co. Ltd, a Japanese listed resource company whose main business consists of producing and importing crude oil, refining oil and the retail sale of fuel products in Japan. Boggabri Coal Mine is located 15 km north-east of Boggabri in the North West Region of NSW within the Narrabri Local Government Area (LGA) (**Figure 1**).

Environmental assessments first commenced at Boggabri Coal Mine in 1976 with the granting of planning approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of Boggabri Coal Mine on 22 August 1989. Construction and development of the Boggabri Coal Mine since approval have included:

- Mine Infrastructure Area including workshop and offices;
- Run of Mine (ROM) coal pad, crusher, conveyors and a truck loadout facility;
- A 17 km bitumen sealed private coal haul road (with bridges over the Namoi River and Kamilaroi Highway) to a rail loadout facility;
- A 3 km rail loop and turnout, a product stockpile with precision train loading facility; and
- The development of the open cut mining area.

The first coal was delivered to the ROM coal pad in October 2006 with construction activities largely completed by November 2006.

The current method of open cut mining allows coal extraction to occur in the uppermost seams within the Maules Creek Formation including the Braymont, Bollol Creek, Jeralong and Merriown Coal seams to a depth of approximately 110 m.

ROM coal is delivered to the onsite crushing facility where it is blended to produce export quality product steaming coal. Product coal is then hauled along a 17 km sealed private haul road to the Boggabri Coal Terminal product stockpile. Product coal is then loaded onto the Werris Creek Mungindi Railway Line and transported to the Port of Newcastle for export. In 2009, 1.5 Million tonnes (Mt) of product coal was produced at the Boggabri Coal Mine.

Boggabri Coal is committed to high standards of environmental performance to meet and where feasible, exceed regulatory requirements and external stakeholder expectations. Since commencement of operations, Boggabri Coal has continued to meet its environmental obligations in all areas of mine development.

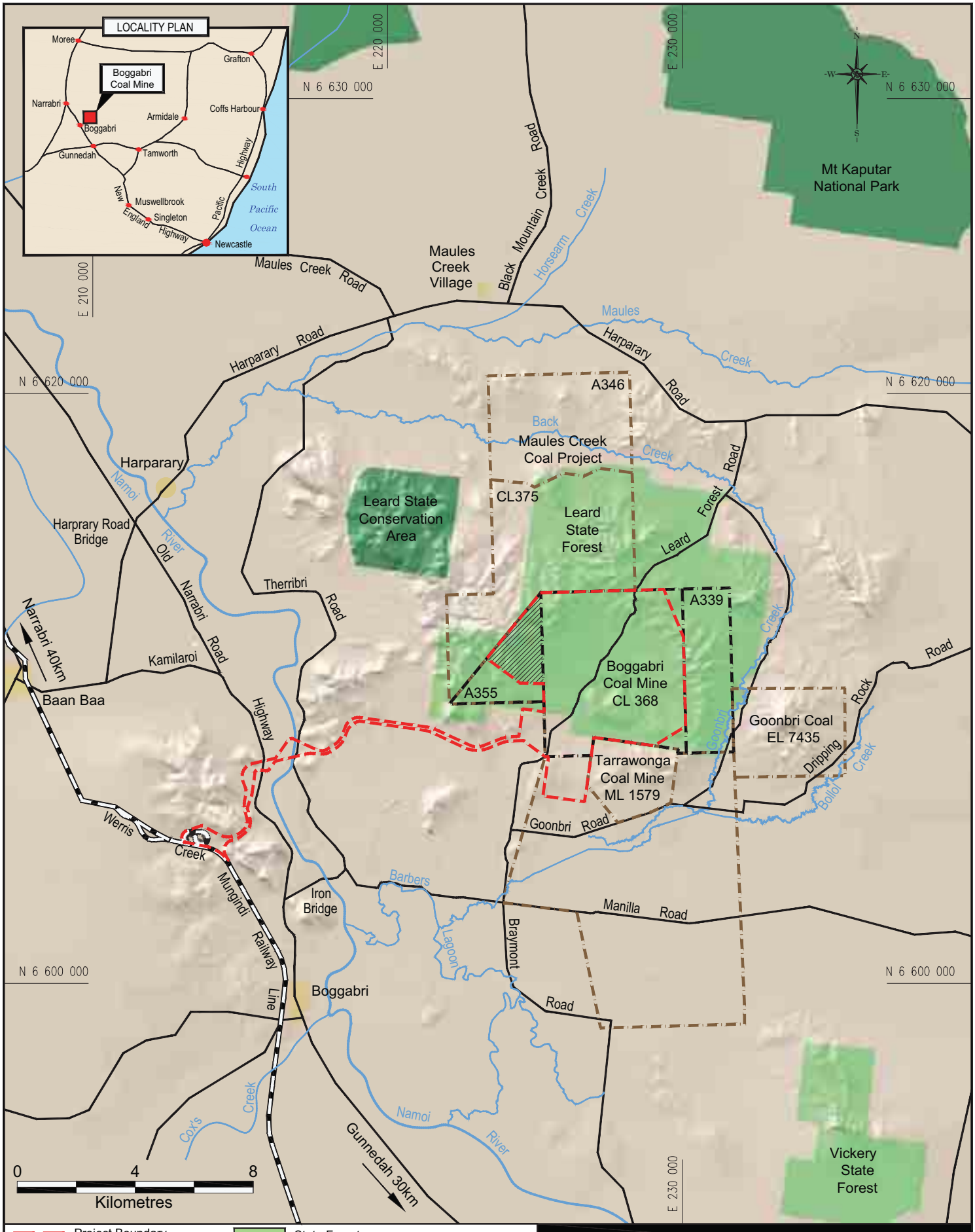
1.2 PROPONENT

The Project proponent is Boggabri Coal (which operates the Boggabri Coal Mine). The address details for Boggabri Coal are:

Boggabri Coal Pty Limited
386 Leard Forest Road
BOGGABRI NSW 2382
Phone: 02 6743 4775
Fax: 02 6743 4496

Boggabri Coal's registered office contact details are:

Boggabri Coal
Level 28 AMP Place
10 Eagle Street
BRISBANE QLD 4000
Phone: 07 3222 5600



BOGGABRI COAL MINE

Regional Locality

Cad File: 05482F.dwg	Date: 12.10.2010	Drawn: CP	Figure 1

1.3 DOCUMENT PURPOSE

Boggabri Coal seeks Project Approval under Part 3A of the EP&A Act for a contemporary Planning Approval for its open cut operations and the mining of additional areas within its mining leases (the Project).

A Major Project Application and supporting Preliminary Environmental Assessment (PEA) were submitted to the Department of Planning (DoP) in September 2009 under Section 75E of Part 3A of the EP&A Act. Subsequently, the Director-General's Environmental Assessment Requirements (EARs) were issued by DoP on 17 December 2009.

This Environmental Assessment (EA) fulfils the requirements of the EARs and assesses the social, economic and environmental impacts of the Project to enable the Minister for Planning to grant the Project Approval as sought. A checklist of each EAR and where it is addressed in the EA is presented in **Section 6**.

The EA applies to the Project Application Boundary (Project Boundary) as shown on **Figure 1** and supports an application for Project Approval.

1.4 DOCUMENT STRUCTURE

The EA consists of three volumes. Volume 1 encompasses the main report and presents a description of the Project, a summary of associated environmental, social and economic impacts and proposed mitigation and management measures as follows:

- **Section 2** provides information relating to the existing environmental setting;
- **Section 3** describes the existing approved mining operation up to November 2011 at Boggabri Coal Mine along with the environmental management controls;
- **Section 4** provides a detailed description of the Project;
- **Section 5** introduces the regulatory framework relevant to the Project;
- **Section 6** details stakeholder engagement undertaken for the Project and discusses issues raised. Specifically, this section lists the EARs and identifies where identified matters are addressed in the EA;
- **Section 7** outlines the risk assessment process adopted to rank all identified social and environmental issues to assist in directing the EA focus;
- **Section 8** assesses environmental and social issues and outlines management and mitigation measures proposed for the Project including Proposed Offset Strategies;
- **Section 9** presents Boggabri Coal Mine's Statement of Commitments (SoC) for the Project;
- **Section 10** provides a detailed justification for the Project;
- **Section 11** lists abbreviations used throughout the EA;
- **Section 12** provides a list of all materials referenced in the EA; and
- **Section 13** lists the EA study team.

Volume 1 also contains regulatory documents and correspondence, stakeholder engagement materials and the risk assessment conducted for the EA. Volumes 2 and 3 present all the remaining technical assessments that support the EA.

2 EXISTING ENVIRONMENT

This section provides a discussion on the existing climate, geology, topography and land use surrounding the Project Boundary. Landownership is also discussed as relevant to the Project.

2.1 CLIMATE

Climatic conditions in the North West Region of NSW are influenced by its latitude, inland location and relative proximity to the Nandewar Range. The region is frequently influenced by periods of low precipitation often resulting in droughts, with the extent and severity increasing towards the west.

Rainfall patterns across the North West Region are influenced by several environmental factors including; low pressure cells from the north often resulting in high intensity daily rains, the passage of inland tropical cyclones and low pressure systems giving way to long duration high intensity rainfall events predominantly during summer, the passage of cold fronts across NSW and localised convection storms resulting in high intensity summer rainfall.

Seasonal climatic conditions vary throughout the year, summer months are predominantly hot and winter periods are relatively short with frequent frosts. Temperature inversions are most common in winter months, forming in the late afternoon and reaching maximum resistance at dawn.

The meteorological monitoring data relied upon for the preparation of the EA was obtained from the Boggabri Automatic Weather Station (Boggabri AWS), Tarrawonga Mine Meteorological Station (Tarrawonga MS), in conjunction with the Bureau of Meteorology (BoM) Monitoring Stations at the Gunnedah Pool and Gunnedah Resource Centre (Gunnedah RC) see **Table 1**.

The meteorological data from the Boggabri AWS was supplemented with data from the Tarrawonga MS in order to obtain a complete data series known as the Boggabri Meteorological Dataset (Boggabri MDS) see **Table 2**.

The Boggabri MDS meets the Department of Environment, Climate Change & Water (DECCW) criteria of 90% retrieval.

A description of the locations and recording periods of each meteorological station is provided in **Table 1**. Meteorological data is summarised in **Table 2** and key parameters discussed below.

2.1.1 Temperature and Humidity

Temperature records from the Gunnedah Pool indicate that summer months are warm with January reaching a mean daily high of 34.0^{o}C (see **Table 2**). July was the coolest month recorded, with a mean daily low temperature of 3.0^{o}C.

Humidity levels exhibit seasonal variability and seasonal flux throughout the year. Mean morning (9:00 am) humidity levels range from 58% - 78% and mean afternoon (3:00 pm) humidity levels range from 40% - 55%.

2.1.2 Rainfall

Rainfall in the North West Region is summer dominant as a result of high intensity summer storms, with falls peaking in summer and declining in winter. The annual mean rainfall recorded at the Gunnedah Pool is 617 mm falling over 72 days.

Results from the Boggabri AWS indicate that the summer months have a higher mean rainfall (78.9 mm) compared to winter months (47.8 mm) over a two year period. These results are generally consistent with the results obtained from the Gunnedah Pool which has recorded higher mean monthly rainfall values during the summer months (68 mm) and lower mean monthly rainfall values in winter (43 mm) over a 134 year period (see **Table 2**).

2.1.3 Evaporation

Data from the Gunnedah RC was used to assess representative evaporative trends typical of the North West Region (see **Table 2**) as the Gunnedah Pool along with the Boggabri MDS, do not record evaporation data.

The higher daily evaporation experienced in the summer months highlights a direct correlation between increased temperature and afternoon winds in the region.

Table 1
Meteorological Stations

Name	Location	Parameters Reported	Period of Record
Boggabri Data Set: Boggabri AWS and Tarrawonga MS	Boggabri AWS: 1 km south of the current infrastructure area, Tarrawonga MS: 2 km south-east of the Boggabri AWS	Wind speed, wind direction, temperature and Stability	Boggabri AWS: September 2008 to August 2009, Tarrawonga MS: November 2008 to December 2008 and September 2009
Boggabri AWS	1 km south of the current infrastructure area	Rainfall, rain days	July 2006 to March 2009
Gunnedah Pool	40 km to the south south-east of the Project Boundary	Temperature, rainfall, rain days and humidity	1876 to current
Gunnedah RC	Approximately 31 km south-east of Project Boundary	Evaporation	1948 to current

Table 2
Meteorological Data Summary

Month	Mean Daily Temperature (°C)				Mean Monthly Rainfall (mm)		Mean Monthly Rain Days		Mean Monthly Relative Humidity (%)*		Mean Monthly Evaporation (mm)**
	Gunnedah Pool		Boggabri MDS		Gunnedah Pool	Boggabri AWS	Gunnedah Pool	Boggabri AWS			
	Min	Max	Min	Max					9 am	3 pm	
Jan	18.3	34.0	19.6	34.5	71.1	56.0	6.5	6.0	60.0	43.0	238.7
Feb	18.1	32.9	18.8	32.9	66.5	100.1	6.1	8.7	65.0	45.0	197.2
Mar	15.8	30.7	15.1	31.1	47.9	19.1	4.6	2.3	64.0	44.0	186.0
Apr	11.4	26.4	12.3	25.5	37.7	13.0	4.3	2.5	67.0	46.0	132.0
May	7.1	21.3	3.0	22.0	42.5	50.0	5.1	3.0	73.0	51.0	83.7
Jun	4.3	17.6	6.5	17.9	43.9	57.2	6.3	6.5	78.0	55.0	57.0
Jul	3.0	16.9	3.9	16.9	42.2	36.1	6.2	4.0	77.0	53.0	58.9
Aug	4.1	18.9	5.4	22.6	41.3	38.7	6.1	3.3	71.0	48.0	86.8
Sep	6.9	22.8	8.6	22.4	39.6	37.1	5.8	2.7	65.0	43.0	120.0
Oct	10.7	26.7	12.3	27.4	55.2	27.6	6.9	4.0	61.0	43.0	164.3
Nov	14.1	30.3	16.2	26.7	61.2	78.3	6.8	8.0	59.0	40.0	201.0
Dec	6.8	33.0	17.8	30.0	68.0	80.7	6.9	8.3	58.0	40.0	241.8
Mean	**10.1**	**26.0**	**11.6**	**25.8**	**51.4**	**49.5**	**6.0**	**4.9**	**66.5**	**45.9**	**147.3**

**Gunnedah Pool Meteorological Station*
***Gunnedah RC Meteorological Station*

Evaporation is greater than annual precipitation with mean monthly pan evaporation rates varying seasonally from 242 mm during December to 57 mm during June, with monthly mean evaporation of 147.3 mm.

2.1.4 Wind Speed and Direction

Annual seasonal windroses prepared from the Boggabri MDS as shown in **Figure 2** indicate that Boggabri Coal Mine predominantly receives wind from the south-east in summer and the north and north-west in winter. Autumn and spring months experience a combination of these wind conditions.

2.2 GEOLOGY

2.2.1 Exploration

Coal was first discovered in the Boggabri area in the early 1900's whilst drilling for water. Extensive exploration drilling has continued at Boggabri Coal Mine, with numerous programs having been conducted within Boggabri Coal's Mining and Exploration leases since 1976.

Drilling programs have been aimed at identifying the extent and the quantity and quality of the potential coal resource. The total number of exploration holes drilled within the mining tenements held by Boggabri Coal as at July 2009 was 510, with a total meterage of 48,517 m.

The drilling program can be categorised into the following stages:

- Commencement of drilling in 1976 – 1979 to identify initial resource;
- From 1980 to 1991, a total of 387 holes drilled within Coal Lease (CL) 368 and A355 of which 38 were either partly of fully cored and 10 were large diameter holes. This program assessed coal quality and washability; and
- Since 1991, Boggabri Coal has drilled a further 123 core drill holes to assess the coal resource including quality and quantity as part the pre feasibility and final feasibility assessment of the Project.

2.2.2 Stratigraphy

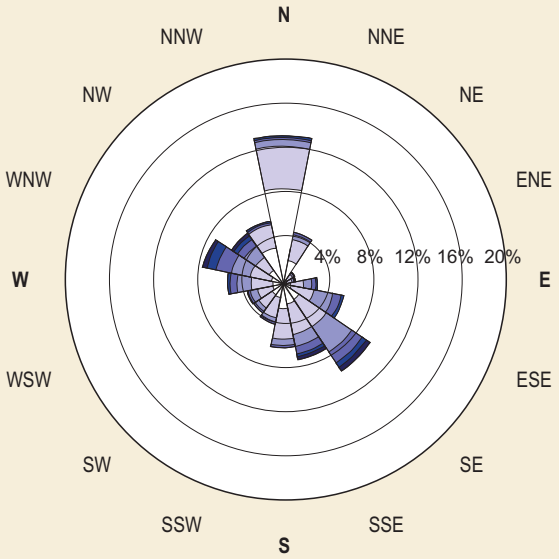
The Project is situated in the north-east of the Gunnedah Basin Coalfield (Gunnedah Basin). There are two coal bearing sequences within the Gunnedah Basin, the early Permian Bellata Group and the Late Permian Black Jack Group. Coal bearing strata found in the Project Boundary are assigned to the Early Permian Bellata Group. The Bellata group is divided into two Sub-basins, the Maules Creek Sub-basin and the Mulalley Sub-basin. These sub-basins are separated by a volcanic intrusion commonly referred to as the Boggabri Ridge.

The Maules Creek Sub-basin is located to the east of the Boggabri Ridge and the Mulalley Sub-basin to the west. The Boggabri Ridge is orientated in a general north-south direction passing through the township of Boggabri and is truncated by the Mooki Thrust system to the south-east of Gunnedah.

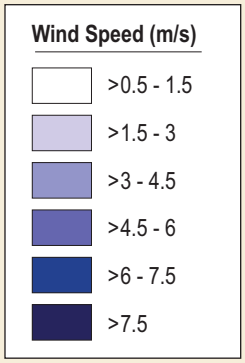
The Boggabri Coal Mine is located between the Boggabri Ridge and the Mooki Thrust Fault within the Maules Creek Formation. The target coal seams are located within the Maules Creek Formation which can reach thicknesses greater than 800 m.

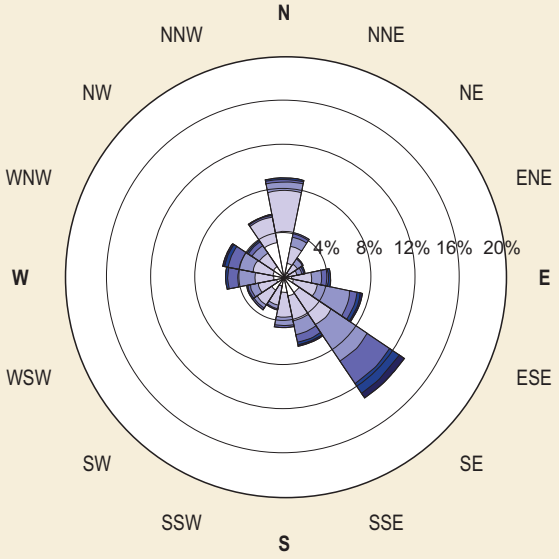
The Maules Creek Formation is the principal coal bearing sequence in the Project Boundary with 16 identified coal seams through to the Templemore seam. Coal is extracted, via open cut methods from the upper most seams. An indicative stratigraphic column for the Project showing the target seams is presented in **Figure 3**. Overburden and interburden materials consist predominantly of sandy conglomerate with minor amounts of interbedded sandstone, siltstone and mudstone. The underlying Leard Formation is highly variable and consists of lithic conglomerate, sandstone, siltstone and mudstone, with the finer sediments generally associated with interbedded coal seams.

Of the 16 identified coal seams within current Mining and Exploration leases, these seams form approximately 60 to 70 recognisable splits. The sequence generally dips to the north-east at 2^{o} to 5^{o}, reaching a total thickness of more than 800 m. There is a tendency for the coal seams to split and thin towards the east of the Project Boundary.

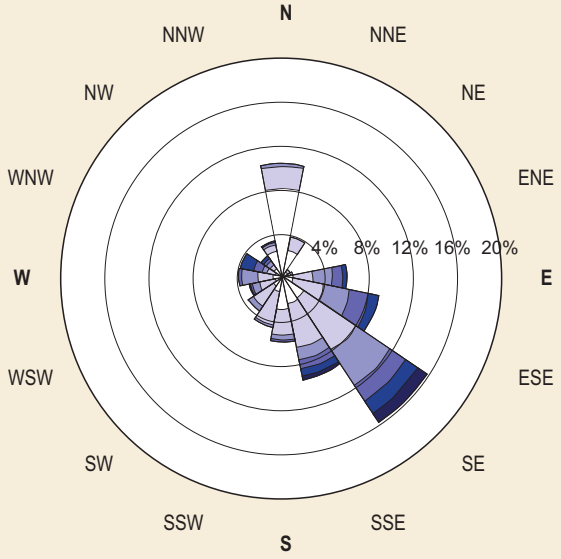


Annual Calms = 14.7%

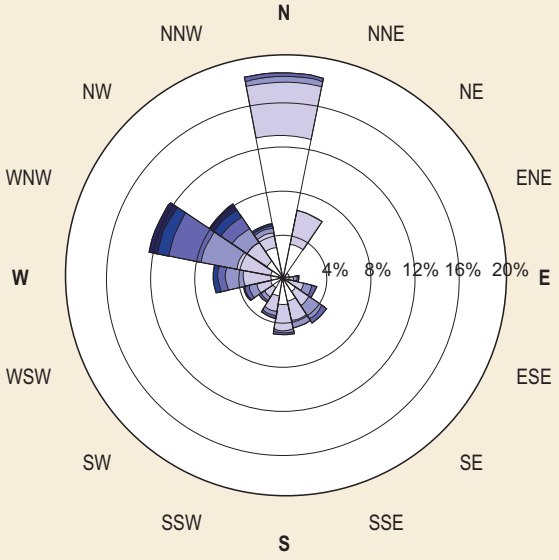




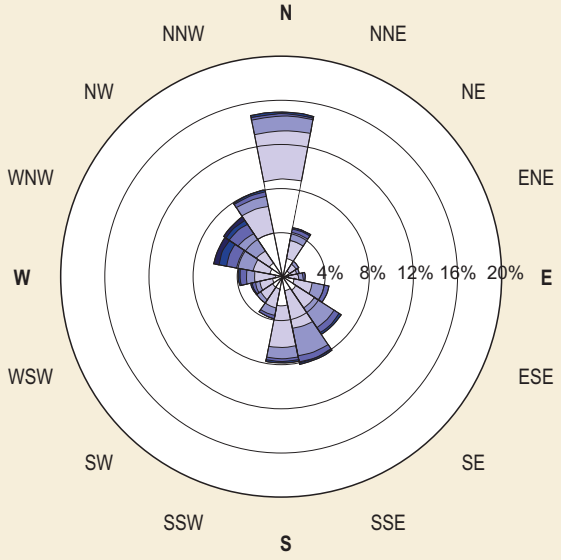
Summer Calms = 16.3%



Autumn Calms = 13.7%



Winter Calms = 13.8%



Spring Calms = 14.7%

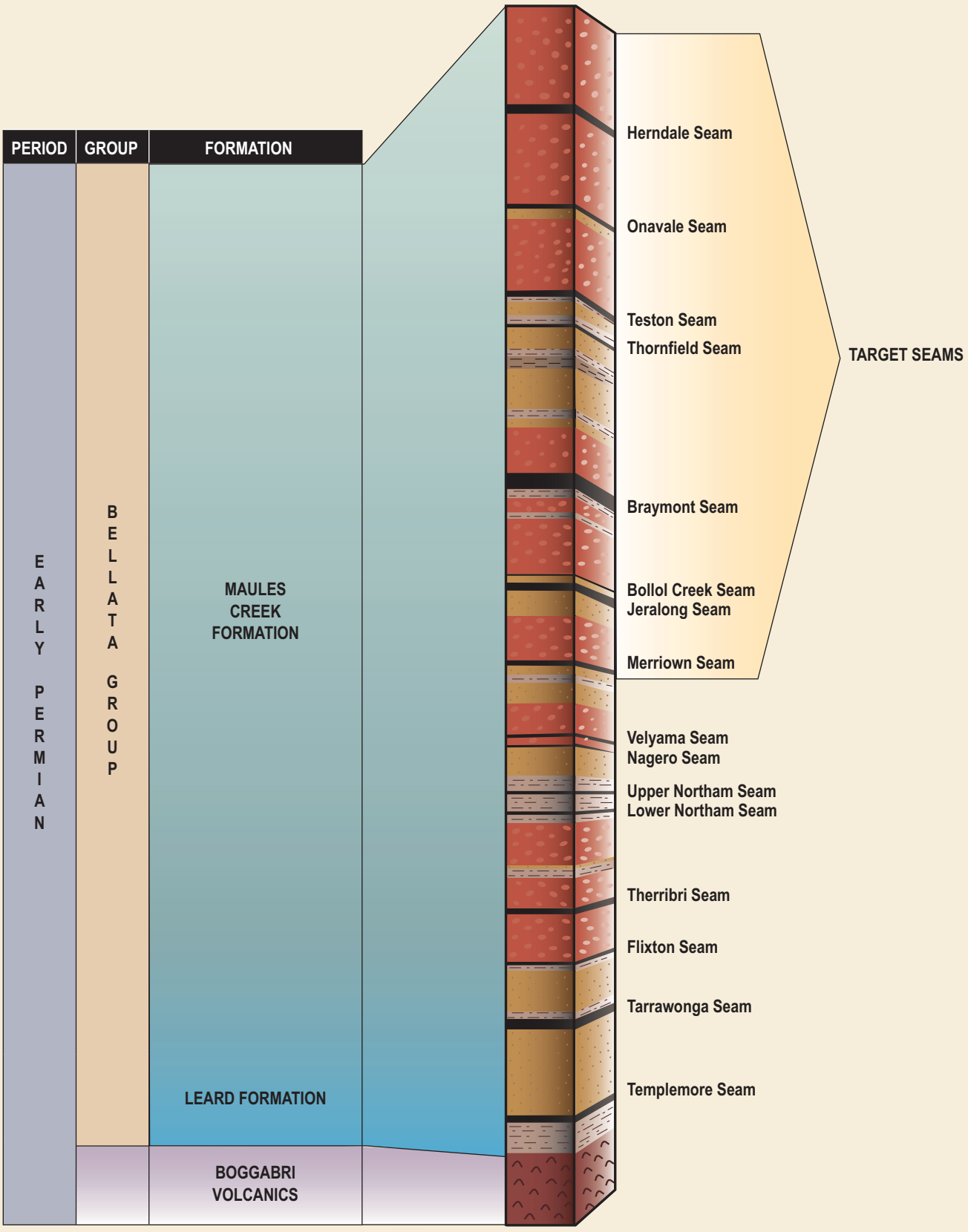
Hansen Bailey

Sources: Boggabri Coal Meteorological Station 2008/2009
Tarrawonga Coal Meteorological Station 2008/2009

BOGGABRI COAL MINE

Windroses for Boggabri Coal Mine

Filename: 914_windrosesfig.indd	Date: 8.3.10	Drawn: MB	Figure 2



Coal
Sandstone
Shale
Volcanics
Conglomerate
Siltstone

HansenBailey

Source Boggabri EIS (1987)
Memoir Geology 12 (1993)

BOGGABRI COAL MINE

Indicative Stratigraphic Column

Figure **3**

Filename: 914_boggabrigeology1.indd | Date: 15.09.10 | Drawn: MB

2.2.3 Reserves and Resource Utilisation

Exploration drilling and feasibility studies within Boggabri Coal's Mining and Exploration leases have indicated that an estimated 1 billion tonnes of inventory coal is available within the tenure. Of this, at least 160 Mt are potentially suitable for extraction via the open cut method of mining.

The predicted stripping ratio for coal accessible by open cut mining methods averages approximately 7 bank cubic meters (bcm) of overburden for every 1 tonne (t) of ROM coal for the Project (7:1).

The coal resources are generally low ash, high volatile, high energy thermal coal with some seams exhibiting high volatile metallurgical coal characteristics.

2.3 TOPOGRAPHY AND LAND USE

2.3.1 Topography and Natural Features

The general topography surrounding the Project Boundary includes steep slopes and crests to the north-east dominated by the Willow Tree Range (430 m Australian Height Datum (AHD)) which forms a broad south-west facing basin. The topography away from the Willow Tree Range is gently undulating. The Namoi River alluvial floodplain forms a wide low lying landform to the west of the Project Boundary.

Goonbri Mountain (543 m AHD), located approximately 3 km east of the Project Boundary, is an isolated mountain located on the western extremity of the Nandewar Range.

The Nandewar Range lies approximately 10 km to the north-east of the Project Boundary and includes Mt Kaputar (1,542 m AHD), the regions highest topographical feature.

Generally, rainfall runoff from undisturbed areas flows south-west from the Willow Tree Range into the ephemeral Nagero Creek and associated tributaries before entering the Namoi River (see **Figure 1**). Flooding of the Namoi River causes inundation of lands within a small portion of the Project Boundary where the existing haul road is located.

2.3.2 Land Use

The predominant land use in the North West Region of NSW is agriculture which is dominated by irrigated and dry land cropping along with sheep and cattle production. The region also supports an array of other minor industries typical of a rural community setting. In recent years coal mining within the Gunnedah Basin has progressed with several new mining development projects commencing operations. In parallel to this the forestry industry has substantially declined as large tranches of previously forested land have been afforded environmental protection under the *Brigalow Nandewar Community Conservation Act 2005.*

The predominant land uses in the Project Boundary include the existing Boggabri Coal Mine, forestry and recreational use of the Leard State Forest and agriculture. To the south-east of the Boggabri Coal Mine is the fertile Namoi River alluvial floodplain as shown on **Figure 1** which supports an array of intensive agricultural enterprises including cotton, wheat and cattle grazing. Each is discussed further below in relation to the Project.

Coal Mining

Coal mining is a common land use in the area as shown on **Figure 1**. In addition to the existing Boggabri Coal Mine the Tarrawonga Coal Mine (Tarrawonga Mine) is located to the immediate south of the Boggabri Coal Mine, with its Mining Lease 1579 forming the south-eastern boundary of the Project.

The Gunnedah coalfield supports a number of other small to medium sized coal mines including the Canyon Mine, Rocglen Mine and Werris Creek Mine. In addition several new mines are anticipated to commence operation in the next few years with the potential for a number of larger operations to commence within the next decade including the Watermark, Caroona and Maules Creek Projects.

State Forests and National Parks

Situated amongst the large areas of agricultural land associated with the Namoi River a number of state forests and National Parks exist.

Boggabri Coal Mine is located within the Leard State Forest, which is utilised for forestry purposes and recreational activities. The Leard State Forest covers an area of approximately 8,134 ha of which the majority is native vegetation communities dominated by Iron Bark, White Box, Blakely's Red Gum and White Cyprus Pine. Leard State Forest was identified for conservation hunting by the NSW Game Council in 2004 which allows for the control of introduced species through recreational hunting.

There are several other State Forests within the regional setting of the Project. Jacks Creek and Bibblewindi State Forests lie approximately 35 km to the west, while Vickery and Kelvin State Forests are situated approximately 15 km and 20 km to the south-east respectively.

The Leard State Conservation Area is located approximately 5 km north-west of the Project Boundary, and covers an area of 1,176 ha. In addition to the Leard State Conservation Area, the foothills of Mt Kaputar National Park lie approximately 25 km to the north of the Project Boundary. Mt Kaputar National Park covers an area of approximately 36,817 ha and offers visitors the opportunity to see unique native flora and fauna whilst participating in an array of outdoor activities including bushwalking, camping, picnicking and sightseeing.

Agriculture

Historically, agricultural land use within and adjacent to the Project Boundary was based on grazing and dry land pasture improvement. The construction of Keepit Dam in the 1960s, and then Split Rock Dam in 1987 ensured a constant water supply was available along the Namoi River during periods of prolonged dry weather. This supported the emergence of intensive cropping enterprises throughout the region.

The Namoi River alluvial floodplain is the most significant tributary in the region, and supports some of the most productive and fertile land within the district. The Namoi River floodplain is located in the western section of the Project Boundary.

The floodplain supports both dry land and irrigated cropping, along with pasture establishment enterprises with water either drawn from the Namoi River or underlying groundwater aquifers. The lighter soils on the surrounding slopes and foothills adjacent to the Namoi River floodplain are used primarily for livestock grazing including sheep and cattle.

Rural and Residential Areas

The small residential township of Boggabri is located approximately 15 km south-west of the Boggabri Coal Mine. Boggabri is located on the Kamilaroi Highway between the larger rural towns of Narrabri, 57 km to the north-west, and Gunnedah located 40 km to the south-east. In addition, there are a number of private rural freehold lands situated in the western extent, outside of the Project Boundary. Further detail in relation to landownership is provided in **Section 2.4**.

2.4 LANDOWNERSHIP

The landownership surrounding the Project Boundary is listed in **Table 3** and indicates if a receiver (private residence) is located on the property. **Table 3** should be read in conjunction with **Figure 4**, which provides an overview of the landownership types surrounding the Project Boundary. Property Identifications for the private receivers correlate with the landownership details in **Table 3**.

There are two principal landowners of property within the Project Boundary those being Forests NSW and Boggabri Coal. The Project Boundary crosses a small portion of land near the Boggabri Coal Terminal that is jointly owned by Boggabri Coal and Aston 2 Coal Pty Limited (Aston Coal). There are no private landholders located within the Project Boundary. The nearest private landholders to the Project Boundary are located adjacent the existing Boggabri Coal Terminal, private haul road and irrigation area. Several other private landholders are located 1.5 km to the east and 7 km to the north of the existing Boggabri Coal Mine open cut activities. The Project Boundary is largely located within the Leard State Forest which is owned by Forests NSW.

A Compensation and Access Agreement is in place between Boggabri Coal and Forests NSW for areas where mining occurs within the Leard State Forest.

The majority of infrastructure that has been constructed for the existing Boggabri Coal Mine is located on land owned by Boggabri Coal. The private haul road passes over the Kamilaroi Highway approximately 8 km north of Boggabri, before crossing a small section (150 m) of declared Crown land.

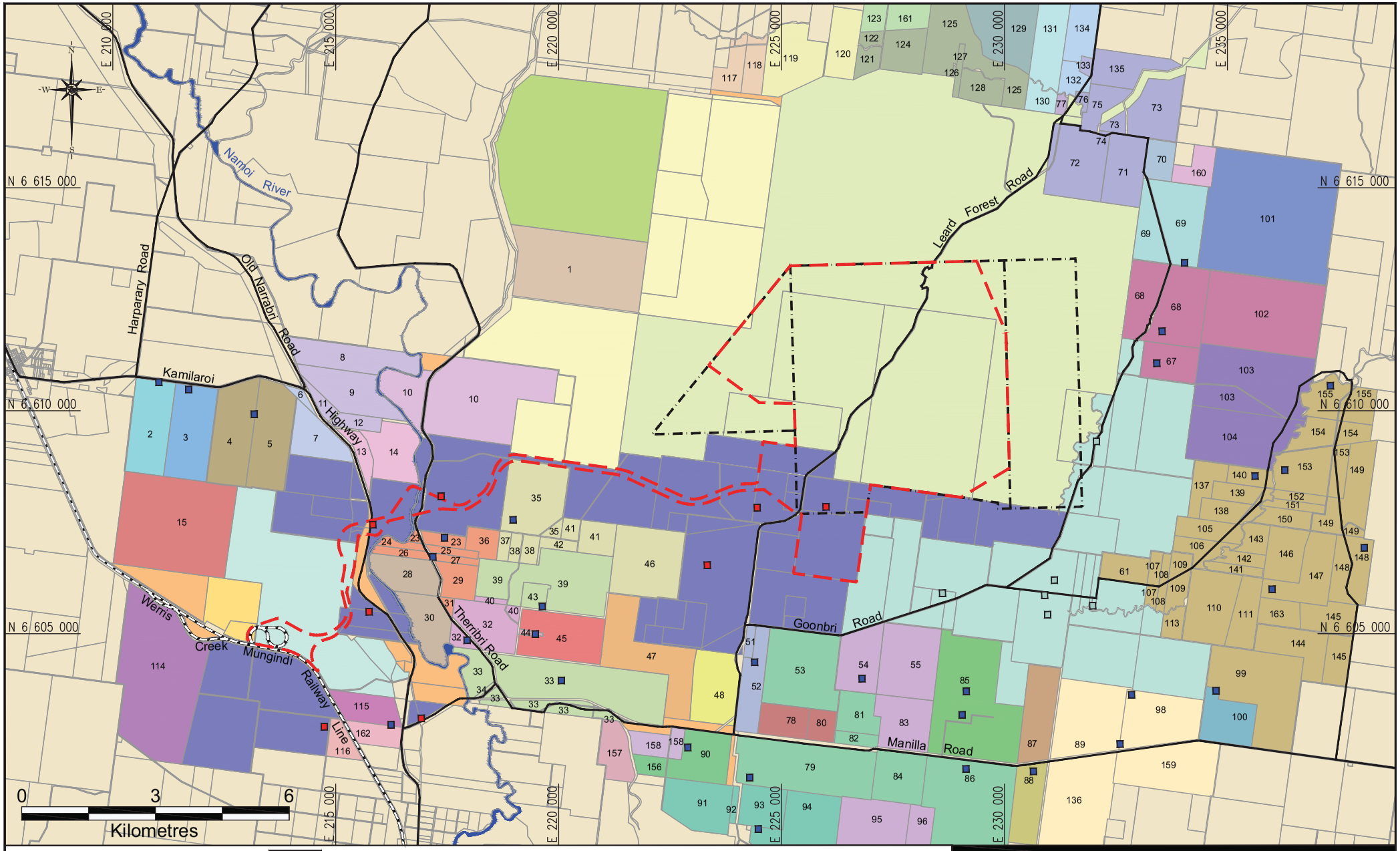
The Boggabri Coal Terminal is located on land jointly owned by Boggabri Coal and Aston Coal. The western portion of the rail loop at the Boggabri Coal Terminal is located on Crown land, Boggabri Coal have a special lease over two Crown blocks in this area (see **Figure 4**). The remaining land is owned by Boggabri Coal. Several other mining companies own land in the vicinity of the Project. Aston Resources owns the land to the north-west of the mining area, and Whitehaven Coal owns the land to the south of the mining area.

Table 3
Landownership

ID	Name	Receiver	ID	Name	Receiver	ID	Name	Receiver
1	MJ & ML Nott (PL) (Louinville)		31	RW & A Grover (Cooboobindi)			Purchased by Tarrawonga Mine previously owned by Bradlock Pty Ltd	
2	FJ Maunder		32	RJ & EJ Browning (Billabong)		67	VP & SM McAuliffe (Goonbri)	
3	RB & ML Kerr		33	RJ Heiler (Brighton)		68	VP & SM McAuliffe (Goonbri)	
4	Glek Pty Ltd		34	RJ Heiler (Brighton)		69	Bank of NSW (Wirrilah)	
5	Glek Pty Ltd		35	KR Druce (Belleview)		70	JD & DJ Duncan(Myal Plains)	
6	PJ Watson		36	RW & A Grover (Cooboobindi)		71	MJ Brennan (Oakleigh)	
7	PJ Watson		37	KR Druce (Belleview)		72	MJ Brennan (Oakleigh)	
8	PJ Watson & G Parkin (Rosewood)		38	KR Druce (Belleview)		73	MJ Brennan (Oakleigh)	
9	PJ Watson & G Parkin (Rosewood)		39	RJ Heiler (Roma)		74	MJ Brennan (Oakleigh)	
10	MF, TT, SL Hart & PF Rice (Kelso)		40	RJ & EJ Browning (Billabong)		75	MJ Brennan (Oakleigh)	
11	PJ Watson & G Parkin (Rosewood)		41	KR Druce (Belleview)		76	MJ Brennan (Oakleigh)	
12	PJ Watson & G Parkin (Rosewood)		42	KR Druce (Belleview)		77	PD & LA Finlay	
13	LE Christie-Rockliff (Horse Shoe)		43	RJ Heiler (Roma)		78	BJ Crosby	
14	LE Christie-Rockliff (Horse Shoe)		44	DV Gillham (Glenhope)		79	RR & PL Crosby (Northam)	
15	LJ & KJ Shields (Leyetonstone)		45	DV & RJ Gillham		80	BJ Crosby	
	Boggabri Coal owned from 9/08/10 previously owned by G.L. Eather		46	KR Druce (Belleview)		81	RR & PL Crosby (Northam)	
	Boggabri Coal owned previously owned by H & M Bullock		47	LE James & KE Woodward (Wilboroi)		82	RR & PL Crosby (Northam)	
	Boggabri Coal owned from 3/02/10 previously owned by DE Eather		48	KR & KA Pryor (Wilboroi East)		83	RP & RD McGregor (Tarrawonga)	
23	RW & A Grover (Cooboobindi)			Boggabri Coal owned previously owned by Bradlock Pty Ltd		84	RR & PL Crosby (Northam)	
24	RW & A Grover (Cooboobindi)		51	HM Lockwood (Jeralong)		85	DJ Wellwood (Ambardo)	
25	RW & A Grover (Cooboobindi)		52	HM Lockwood (Jeralong)		86	RR & PL Crosby (Kyalla)	
26	RW & A Grover (Cooboobindi)		53	RR & PL Crosby (Northam)		87	PL & AC Laird (Templemore)	
27	RW & A Grover (Cooboobindi)		54	RP & RD McGregor (Tarrawonga)		88	MA, CM, JM & SL Bull (Pine Grove)	
28	GP, LF & WP Clarke (Bullock Paddock)		55	RP & RD McGregor (Tarrawonga)		89	JL Alker (Flixton)	
29	RW & A Grover (Cooboobindi)			Properties purchased by Tarrawonga Mine previously owned by GOM Johnson and DC & EL Cheeseman		90	KD Gillham (Barbers Lagoon)	
30	GP, LF & WP Clarke (Bullock Paddock)		61	JE & RJ Picton		91	RP McGregor (Callandar)	

ID	Name	Receiver	ID	Name	Receiver	ID	Name	Receiver
92	RP McGregor (Callandar)		116	RA & CM Collyer		140	JE & RJ Picton	■
93	RP McGregor (Callandar)		117	DJC Watson		141	JE & RJ Picton	
94	RP McGregor (Callandar)	■	118	DJC Watson		142	JE & RJ Picton	
95	RP & RD McGregor		119	VA & MA Younger		143	JE & RJ Picton	
96	RP & RD McGregor		120	VA & MA Younger		144	JE & RJ Picton	
	Purchased by Tarrawonga Mine previously owned by GOM Johnson		121	CM & RRF Morse		145	JE & RJ Picton	
98	JL Alker (Flixton)	■ ■	122	CM & RRF Morse		146	JE & RJ Picton	
99	JE & RJ Picton		123	CM Morse		147	JE & RJ Picton	■
100	AIM Johnson & TR Hall (Bailey Park)	■	124	CM & RRF Morse		148	JE & RJ Picton	■
101	NF Smith		125	CM & RRF Morse		149	JE & RJ Picton	
102	VP & SM McAuliffe (Goonbri)		126	CM & RRF Morse		150	JE & RJ Picton	
103	PM & MI Mainey		127	CM & RRF Morse		151	JE & RJ Picton	
104	PM & MI Mainey		128	CM & RRF Morse		152	JE & RJ Picton	
105	JE & RJ Picton		129	Morse Investments Pty Ltd.		153	JE & RJ Picton	■
106	JE & RJ Picton		130	PD & LA Finlay		154	JE & RJ Picton	
107	JE & RJ Picton		131	PD & LA Finlay		155	JE & RJ Picton	■
108	JE & RJ Picton		132	LA & KA & PD Finlay		156	KD Gillham (Barbers Lagoon)	
109	JE & RJ Picton		133	Narrabri Shire Council (Oakleigh)		157	DV Gillham (Hopetoun Park)	
110	JE & RJ Picton		134	LA & KA & PD Finlay		158	KL Grover	
111	GOM Johnson		135	MJ Brennan (Oakleigh)		159	JL Alker (Flixton)	
	Purchased by Tarrawonga Mine previously owned by GOM Johnson		136	JL Alker (Flixton)		160	MJ & KA Brennan (Oakleigh)	
113	JE & RJ Picton		137	JE & RJ Picton		161	CM Morse	
114	RE & MJ Stoltenberg (Dunvegan)		138	JE & RJ Picton		162	RW & EJ Kemp	
115	DW & AM Keys (Hazeldene)	■	139	JE & RJ Picton		163	JE & RJ Picton	

NB: A coloured square denotes a residence on the property



- Project Boundary
- Boggabri Mining Tenements
- Boggabri Coal
- Whitehaven Coal Mining
- Aston Resources
- Not Searched
- Crown
- Crown - Special Lease
- NSW State Forest
- Leard State Conservation Area
- Mining Joint Ownership
- Private Freehold Receiver
- Boggabri Coal Owned Receiver
- Other Mine Owned Receiver

Land Searches LPI 2009/2010
Co-ordinate System: MGA 94 Zone 56

BOGGABRI COAL MINE

Land Ownership

Cad File: 06611F.dwg	Date: 13.10.2010	Drawn: JD	Figure 4

3 APPROVED OPERATIONS

This section describes the status of approved mining operations including a detailed description of the current mining activities and works to be completed up to 14 November 2011 when Boggabri Coal's current planning approval expires. It also provides a description of approved, but not yet completed, works under the current planning approval.

3.1 BACKGROUND

Boggabri Coal Mine currently operates under the original Development Consent and supporting Environmental Impact Statement titled *Environmental Impact Statement Joint Venture Boggabri Coal Project 1987* (Boggabri EIS) prepared by the Boggabri Joint Venture (BHP Minerals Limited, Agip Coal Australia Pty Ltd and Idemitsu Boggabri Coal Pty Limited), and the *Boggabri Coal Project Statement of Environmental Effects to Support Section 96 Application to Modify Development Consent* (Boggabri Modification SEE) completed by Parsons Brinckerhoff in 2009.

All approved activities are described briefly below with each illustrated on **Figure 5**.

3.1.1 Boggabri EIS

The NSW Minister for Local Government and Minister for Planning (now NSW Minister for Planning) granted Development Approval DA 36/88 (Development Consent) to the Boggabri Coal Joint Venture on 22 August 1989 in support of the Boggabri EIS.

The Boggabri EIS permitted the extraction of coal for a period of 21 years following the approval of CL 368 on 15 November 1990. As a result, the Development Consent permits the extraction of coal within the identified 'limit of surface mine' to the Merriown seam at a maximum production rate of up to 5 Million tonnes per annum (Mtpa) to 14 November 2011.

The approved method of mining includes a combination of truck and shovel, and dragline operations.

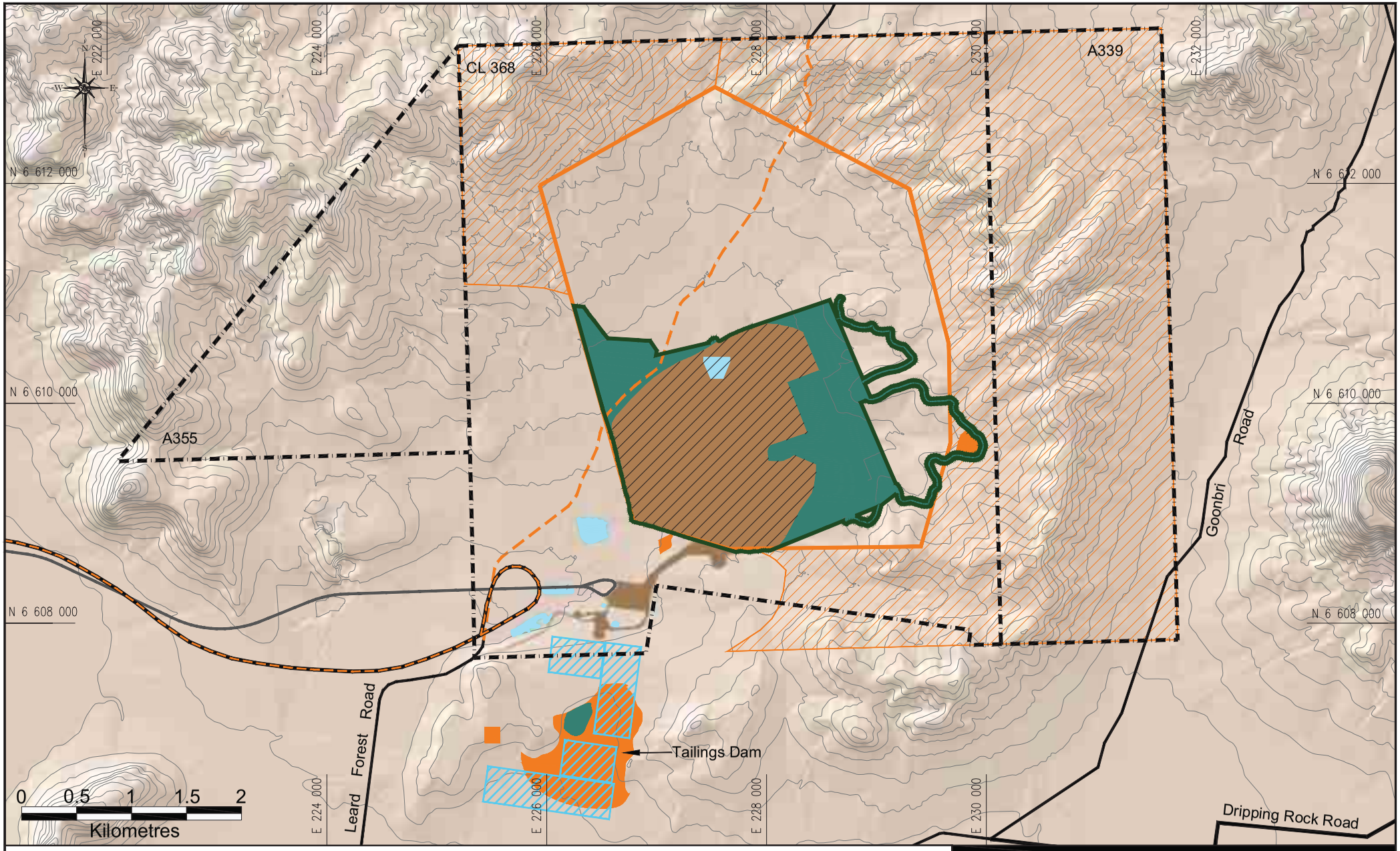
Initially, overburden above the Braymont seam was removed by truck and shovel with a dragline proposed to be introduced to extract interburden to the Merriown seam. An equipment schedule was developed that states that both equipment sizing and numbers may change according to market conditions. The approval also facilitated the establishment of infrastructure facilities including:

- Construction of offices, workshops, bathhouse, access roads and mine water storage;
- A 45,000 t raw coal stockpile area;
- A coal crushing and sizing plant which conveys to the product stockpile;
- Two identical Coal Preparation Plant (CPP) facilities each with the capacity to process up to 2.5 Mtpa;
- A rail spur and rail loop with a coal loadout facility; and
- A 3 million cubic metre capacity tailings dam.

Construction of the Boggabri Coal Mine was permitted to be conducted between 7:00 am and 9:00 pm, Monday to Saturday. No construction was to take place on Sunday or public holidays. Mining was permitted to occur 24 hours per day, 7 days a week. Up to 495 personnel were anticipated at full production.

Approval was granted to haul coal by trucks from the mine site to the Boggabri Coal Terminal via a 17 km private sealed haul road. At full production, a 17 km rail spur line including a rail loop and bridge crossing over the Namoi River capable of handling a 1 in 100 year Average Recurrence Interval (ARI) rainfall event was also approved.

In addition, a 125,000 t product coal stockpile with the ability for coal to be reclaimed and conveyed into a 1,500 t rail loading bin with a loadout capacity of up to 5,000 tonnes per hour (tph) was approved.



Boggabri Mining Tenements
Roads

Current Operations
- Open Cut
- Additional Works up to Nov 2011
- Existing Infrastructure Area
- Water Storage
- Irrigation Areas
- Mine Disturbance to Nov 2011
- Private Haul Road

EIS Approved Works not Commenced
- Infrastructure
- Limit of Surface Mine
- Rail Loop
- Underground Mining Area
- Leard Forest Road Closure

Source: SEE (2009), EIS (1987), Boggabri Coal (2010)

BOGGABRI COAL MINE

Approved Mining Operations

Cad File: 06051C.dwg	Date: 07.04.2010	Drawn: JD	Figure 5

Mining activities commenced at Boggabri Coal Mine in accordance with the Development Consent in May 2006. Current operations are being conducted via truck and shovel method of mining, a dragline has not been introduced under the original approval. Other infrastructure approved but not yet constructed includes the CPPs, tailings dam and rail spur and loop.

3.1.2 Boggabri Modification SEE

An application to modify the Development Consent was lodged in February 2009 supported by the Boggabri Modification SEE. The modifications sought were as follows:

- Alterations to the final landform;
- Realignment of diversion dam and associated drainage line design as operations progress;
- The construction of a 100 Megalitre (ML) water storage facility;
- Establishment of a water treatment and irrigation network covering a total area of 95 ha, separated into four plots; and
- The construction of a storage shed for core samples from exploratory drilling.

The application to facilitate the above modifications was granted by the Director for Major Development Assessment, as delegate for the Minister for Planning on 22 July 2009.

3.2 COAL MINING

Open cut coal mining is conducted via hydraulic shovel allowing the greatest operational flexibility in coal extraction at Boggabri Coal Mine. The open cut mining process involves the salvage of any potentially commercial fire wood, removal and mulching of any remnant vegetation, stripping and stockpiling of the topsoil resource, drilling and blasting of overburden, excavation of overburden to expose coal resources, extraction of ROM coal, overburden emplacement followed by progressive rehabilitation.

Clearing and topsoil stripping is undertaken as a one off event on an annual basis with the area cleared being that required for the subsequent year of operations.

Prior to clearing of vegetation pre clearing fauna surveys are undertaken followed by commercial timber harvesting for fire wood, clearing, seed collection, mulching and removal of large debris. Topsoil and mulched vegetation is removed with the use of dozers and excavators and where possible, placed directly onto reshaped overburden or alternatively stockpiled for future use.

The removal of overburden and interburden material is conducted with the use of hydraulic excavators in backhoe configuration to load rear dump trucks. In order to minimise coal damage, a Hitachi 1900 hydraulic excavator is used to remove the final 1 m of overburden or interburden overlying the coal seams. Coal extraction extends down to the base of the Merriown coal seam. Coal is currently being mined from the Braymont, Bollol Creek, Jeralong and Merriown seams. The blended product is a relatively low ash, high volatile, low sulphur thermal and pulverised coal injection coal.

Boggabri Coal contracts Downer EDI Mining to handle and transport ROM coal from the pit to the ROM coal pad and Lovton Coal to crush and transport the product coal to the Boggabri Coal Terminal and the loading of the trains. Blasting is generally conducted between the hours 8:00 am and 5:00 pm with any blasting taking place within 500 m of the Leard Forest Road requiring the temporary road closure. During 2009 a total of 1.5 Mt of product coal was railed from Boggabri Coal Mine to the Port of Newcastle for export.

3.3 COAL HANDLING AND TRANSPORTATION

Coal from the mine is loaded onto rear dump trucks and transported to the ROM coal pad. Coal is recovered from the ROM coal pad by front end loader and trammed to a crusher for sizing to approximately 50 mm. Crushed coal is conveyed to a 380 t truck loading bin where it is batch loaded into oversized B-double trucks for transport to the Boggabri Coal Terminal along a 17 km private haul road. The private haul road crosses Leard Forest Road and Therribri Road and has a bridge over the Namoi River and overpass across the Kamilaroi Highway.

The Boggabri Coal Terminal includes a 125,000 t capacity product coal stockpile area, a dozer push stacking and reclaim system, conveyors, train loading bin with a loading capacity up to 5,000 tph and rail loop. Product coal is transported via the Werris Creek Mungindi Railway Line to the Port of Newcastle for export.

3.3.1 Infrastructure

The existing coal crushing and handling plant has been designed and installed to achieve a nominal throughput rate of 500 tph which is suitable for upgrade to a higher capacity. It consists of a:

- Coal receival hopper of 60 t nominal capacity fitted with a 750 mm grizzly, designed to accommodate a 13 m^3 front end loader;
- Crushing system comprising a feeder breaker producing maximum 200 mm top size product and a sizer of 500 tph capacity producing nominal 50 mm product with a capacity in excess of 2.5 Mtpa;
- 500 tph loadout bin conveyor capable of being upgraded to 850 tph;
- Truck Loading Bin System comprising a 380 t capacity bin with a bypass chute for emergency stockpiling. The truck loadout system is automated and has an instantaneous loadout rate of 2,000 tph;
- Product stockpile adjacent to rail loadout of approximately 125,000 t capacity; and
- Train Loadout System comprising:
    - Reclaim system with two drawdown hoppers and two low headroom modulating flow control gates;
    - Loadout conveyor of up to 5,000 tph capacity; and
    - Automatic train loadout system incorporating a Precision Loading System with 150 t surge bin and 40 t weigh bin capable of loading trains at up to 5,000 tph.

3.3.2 Power

Boggabri Coal Mine is supplied electricity via two 66 kV sub-transmission power lines that originate from 132/66 kV substations located at Gunnedah and Narrabri. Several 66/11 kV substations are located in the Boggabri area supplying local distribution feeders, including the 11 kV feeder that supplies the existing mine. Country Energy is the current electricity service provider.

The existing mine site is supplied by a single circuit 11 kV 3 - phase overhead radial feeder. There are two 11 kV/415 V substations at the mine site supplying the mine facilities.

3.3.3 Equipment and Manning

Mining operations are currently conducted on two 10.5 hour shifts, seven day per week basis with maintenance activities occurring 24 hours per day seven days a week. The current workforce is made up of approximately 145 mining, maintenance and transport services employees. There is currently no shift work on Saturday nights and Sunday mornings due to the stage of production build-up. Downer EDI Mining is contracted by Boggabri Coal to handle and transport coal from the pit to the ROM coal pad. Lovton Coal is contracted to crush and haul the coal to the Boggabri Coal Terminal and to load the trains.

3.4 EXISTING REGULATORY APPROVALS

The currently approved mining activities at Boggabri Coal Mine are described in **Section 3.1**. In accordance with the EARs, copies of these approvals are included in **Appendix A**. Mining operations and exploration activities are approved under two separate planning approvals within three mining tenements, the status of which are shown in **Table 4**.

Boggabri Coal will continue to operate under its existing Development Consent pending its expiry on 14 November 2011. Following the expiry of its original approval Boggabri Coal propose to continue to operate its mining activities in accordance with a new planning approval for a further 21 years.

It is recognised that there will remain additional coal reserves within Boggabri Coal's mining tenements that would facilitate open cut coal mining and underground coal mining past this point.

Boggabri Coal also holds a number of other ancillary environmental licences and approvals to conduct its mining and associated activities which are summarised in **Table 4**.

Applications will be made to vary the above list of ancillary environmental licences and approvals as required to facilitate the Project following the expiry of its original planning approval, as discussed in **Section 3.1**.

3.5 ENVIRONMENTAL MANAGEMENT

IAR and Boggabri Coal have created and implemented an effective Environmental Management Policy that provides the framework to facilitate compliance with legal and other requirements (including statutory approval and stakeholder expectations).

The Policy is based on the framework of ISO14001, which is the International Standard for the development, implementation, continual review and improvement of an environmental management system.

Table 4
Boggabri Coal Licences and Approvals

Ref	Number	Approval Title	Date Granted	Authority
1.	DA 36/88	Boggabri Coal Project Development Consent	15/11/90 – 14/11/11	DOP
2	CL368	Coal Lease surface to unlimited (with surface restriction under A339)	15/11/90 – 14/11/11	I&I NSW
3	A355	Authorisation surface to unlimited	19/07/84 – 11/04/10	I&I NSW
4	A339	Authorisation surface to 20 m	11/04/84 – 10/04/11	I&I NSW
5	EPL 12407	Environment Protection Licence	Anniversary 11 January	DECCW
6	WAL 2571	General Security, Water Access Licence, 51 unit shares	01/07/04	NSW Office of Water (NOW)
7	WAL 2572	Supplementary Water Access Licence, 5.6 unit shares	01/07/04	NOW
8	WAL 2595	General Security, Water Access Licence, 243 unit shares	01/07/04	NOW
9	WAL 2596	Supplementary Water Access Licence, 26.1 unit shares	01/07/04	NOW
10	90BL255090	Low Security Water Licence, (yet to be converted to a WAL under the *Water Management Act 2000*)	18/01/10	NOW
11	90BL252849	Water Licence, converted to WAL 15037	01/11/06 – 30/10/10	NOW
12	90BL253854	Water Licence	06/07/07 – 05/07/12	NOW

A component of the Environmental Management Policy is the development and implementation of a number of Environmental Management Plans (EMPs) including:

- Water Management EMP;
- Air Quality EMP;
- Flora and Fauna EMP;
- Cultural Heritage EMP;
- Hydrocarbon EMP;
- Noise and Vibration EMP;
- Waste EMP;
- Rehabilitation and Land Management EMP;
- Public Safety EMP; and
- Irrigation Area EMP.

All EMPs are regularly reviewed, communicated to the workforce and audited against for compliance to ensure a high level of environmental performance and legal compliance is maintained.

3.6 ENVIRONMENTAL MONITORING PROGRAM

Boggabri Coal has implemented a comprehensive Environmental Monitoring Program which allows effective quantitative measurement and management of its environmental performance. The existing Boggabri Coal monitoring network is illustrated on **Figure 6** and comprises of:

- A meteorological monitoring station;
- 15 depositional dust gauges;
- A High Volume Air Sampler (HVAS) measuring PM_{10};
- 11 noise monitoring sites;
- 12 groundwater monitoring bores; and
- Seven surface water sampling points.

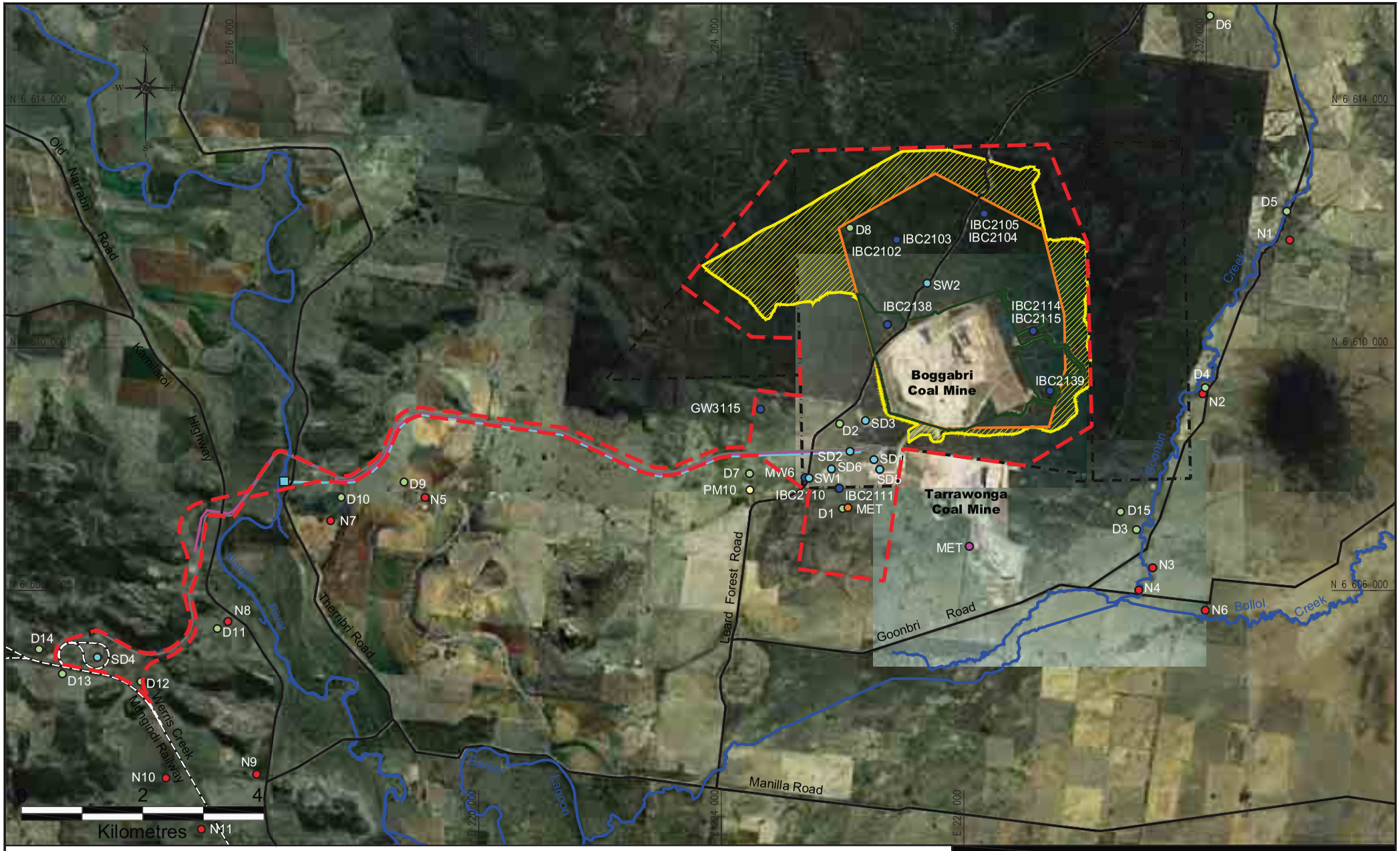
Results from the Environmental Monitoring Program measuring Boggabri Coal's environmental performance are published in the Annual Environmental Management Report (AEMR), and distributed to Government Agencies, employees, the Boggabri Community Consultative Committee (Boggabri CCC) and other interested stakeholders.

3.7 ADDITIONAL WORKS TO NOVEMBER 2011

On 8 September 2009 IAR announced its commitment to the Boggabri Coal Mine through the allocation of up to $150 Million for additional plant and infrastructure works. Additional works will include construction and mining activities approved under Boggabri Coal's original planning approval and will be completed prior to its expiry on 14 November 2011.

Additional works will include the following:

- Construction of a mechanised stacking system which will allow a 200,000 t stockpile within the current stockpile area at the Boggabri Coal Terminal and modifications to the reclaim and train loading system including a hi-volume dust sprinkler system for dust suppression;
- Construction of a separate heavy vehicle service bay and installation of additional self bunded diesel fuel storage tanks;
- Upgrades to the sewerage treatment system to accommodate increased contractor manning numbers;
- Construction of a heavy vehicle wash bay area to replace the existing wash bay, construction of a separate wash bay for the B double trucks and construction of an additional light vehicle wash bay;
- Widening and upgrades of the existing 17 km private coal haul road;
- Construction of an additional two workshop bays and maintenance bay;
- Upgrades and additions to the bathhouse and office complexes;
- Installation of a trial irrigation system on adjacent rural lands and integration of this into the existing mine water management system; and
- Construction of clean water diversion drains around active mining areas.



Project Boundary
Boggabri Mining Tenements
Existing Rail
Mine Disturbance Boundary
Mine Disturbance to Nov 2011
EIS Mine Disturbance (Boggabri Existing)
Boggabri Extension
Roads

Private Haul Road
Rivers and Creeks
Indicative Powerline
Indicative Water Pipeline
Indicative Water Pump Station
Boggabri Meteorological Station
Tarrawonga Meteorological Station
Groundwater Monitoring Site

Surface Water Monitoring Site
Noise Monitoring Site
Depositional Dust Monitoring Site
HVAS PM10 Monitoring Site

Co-ordinate System: MGA 94 Zone 56
Source: Google Maps, Whitehaven Coal (2009), Boggabri Coal (2010)

Heggen Bailey

BOGGABRI COAL MINE

Current Mining Operations & Environmental Monitoring Program

Cad File: 06031E.dwg	Date: 24.06.2010	Drawn: CP	Figure 6

These additional works will be undertaken in a staged approach as production levels increase up to 3.5 Mtpa prior to 14 November 2011. The modifications and upgrades as described above are approved in the original planning approval and are described in the supporting Boggabri EIS and Boggabri Modification SEE for the Boggabri Coal Mine and as such do not require any additional planning approvals.

The proposed timing of these additional works relates to Boggabri Coal needing to enter into, take or pay rail and port contracts to ensure it maintains access to the Hunter Valley Coal Chain.

3.8 APPROVED WORKS NOT COMPLETED

Section 3.1 illustrates the key features as approved by the Development Consent and the supporting Boggabri EIS and Boggabri Modification SEE. Some of these works will not be in place at the time of the expiry of Boggabri Coal's existing approval.

A summary of approved activities and equipment not likely to be in place or construction completed by November 2011 is provided below:

Mine Plan

- The Boggabri EIS identified a 'limit of surface mine' boundary within which open cut mining operations (extraction of approximately 90 Mt of coal to the Merriown seam at up to a maximum of 5 Mtpa); and
- Underground Mining operations including bord and pillar methods and longwall mining over an extensive additional area.

Equipment and Manning

- Manning of up to 495 personnel at full production; and
- The utilisation of a combination of dragline and truck / shovel operations. The Boggabri EIS includes a conceptual major equipment schedule stating that both equipment sizing and numbers may change with market conditions. A list of current and approved mining equipment is included in **Table 5**.

Infrastructure

- Two identical CPP facilities including raw coal handling, coal bypass, coal preparation and product coal handling facilities (for rail) each with a capacity to process 2.5 Mtpa; and
- 3 Million cubic metre capacity tailings dam located to the south of the mining area.

Product Coal Transport

- At full production, a 17 km rail spur line including balloon loop and bridge crossing over the Namoi River and Kamilaroi Highway.

Table 5
Approved and Current Equipment List

Detail	Approved (Boggabri EIS)	Current
Dragline	1	0
Electric Shovels	5	0
Excavators	5	4
Trucks	42	12
Graders	4	2
Bulldozers (includes rubber tyred)	17	7
Front End Loader	2	1
Water carts	4	3
Drills	7	2

4 THE PROJECT

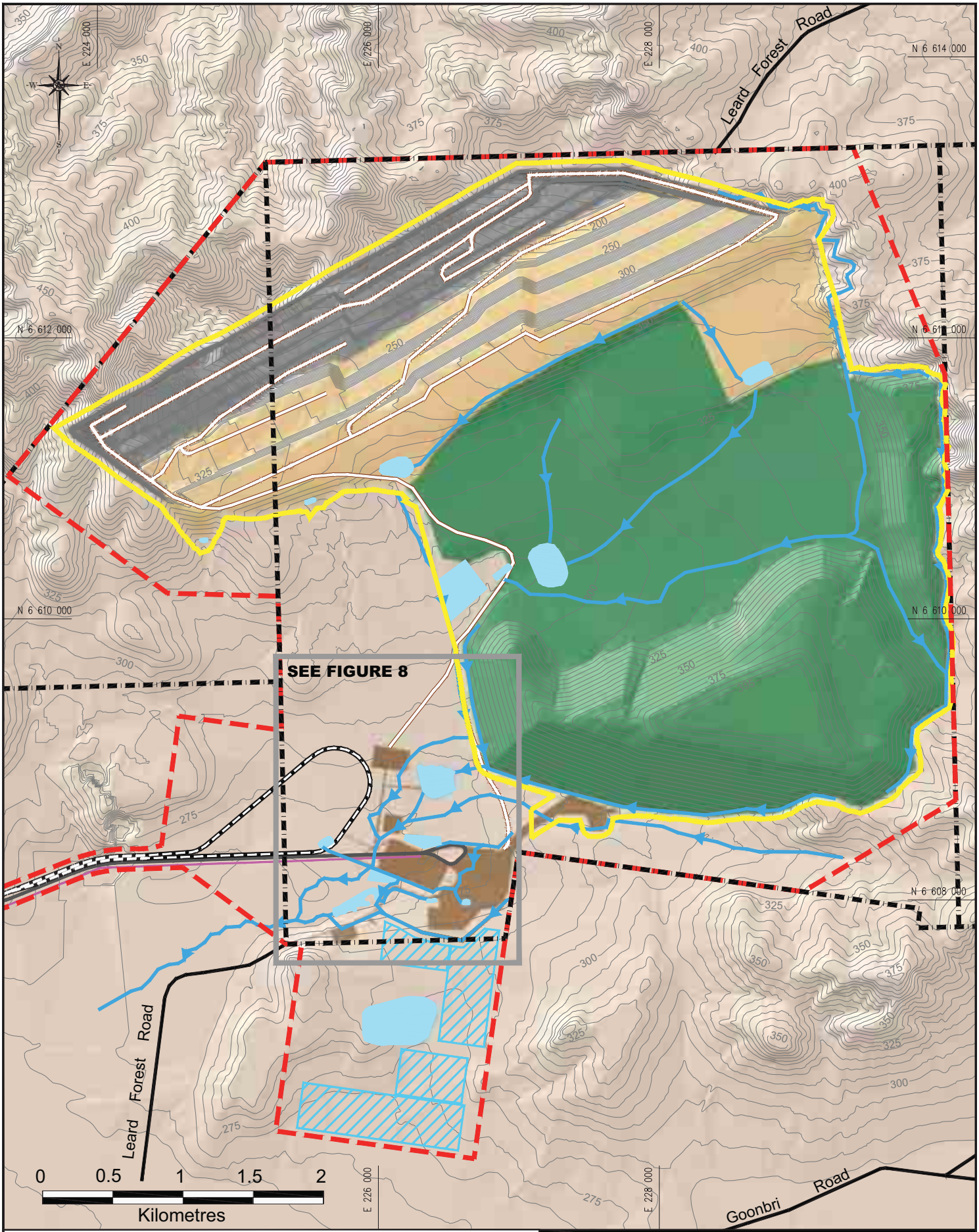
4.1 SUMMARY

This section includes a detailed description of the Project including: the conceptual mine plan, equipment and manning requirements, a description of upgrades / modifications to existing infrastructure, waste strategy and indicative construction phases (see **Figure 7**). It also includes a discussion on the need for the Project and a Justification of the proposed mine plan.

Boggabri Coal is seeking a Project Approval under Part 3A of the EP&A Act to gain a single, contemporary planning approval for the continuation of its mining operations within its current mining tenements and on land listed in **Appendix B** for a further 21 years (the Project).

In seeking Project Approval, Boggabri Coal also seeks to maximise operational flexibilities through staged additions and upgrades to infrastructure and an increase in approved coal production to enable it to be in a position to take advantage of any favourable market opportunities going forward. The Project generally comprises the following:

- Existing mining equipment, plant and infrastructure and additional works completed prior to November 2011 as described in **Section 3** will form part of the Project;
- Open cut mining will continue using conventional shovel / excavator and truck fleets and as mining configurations and conditions warrant / allow, the potential introduction of a dragline. Mining will occur up to 7 days per week, 24 hours per day and excavate up to depths of approximately 180 m to the base of the Merriown coal seam. Production will increase in stages to ultimately achieve 7 Mtpa of product coal for the export market;
- Construction of a CPP and associated infrastructure including a 600,000 t product stockpile and reclaim system to meet market demands;
- Out of pit Overburden Emplacement Area's (OEA) will be created to the south and east of the mining excavation area and once there is sufficient space for in pit dumping, the open cut mine area will be progressively backfilled with overburden;
- The mine water management system will divert clean water around the mining and site infrastructure areas and capture dirty water runoff and mine water in storage structures for reuse;
- Mine haul roads will be constructed as mining progresses, to connect the advancing open cut mining area to the ROM pad, CPP and mine infrastructure area. Temporary ROM stockpile(s) will be created within the open cut mining area to manage ROM coal;
- Light vehicle roads from the mine infrastructure area to the open cut mine area will be developed and extended as mining progresses;
- Widening of the private haul road to transport up to 7 Mtpa of product coal;
- Construction of a rail loop and 17 km rail spur line across the Namoi River and floodplain including overpasses across Therribri Road, the Namoi River and the Kamilaroi Highway, connecting the mine to the main north-west rail line adjacent the Boggabri Coal Terminal;
- Construction of train loading infrastructure adjacent the rail loop for loading coal onto trains for rail transport;
- Installation of additional mine power supply including the construction of a supply line with a capacity of up to 132 kV from near the Boggabri Coal Terminal to the mine infrastructure area and a sub-station pad. Power lines will be extended into the mine area to service electric shovels and dragline as required;



BOGGABRI COAL MINE

The Project

Cad File: 06049E.dwg	Date: 17.05.2010	Drawn: CP	Figure 7

- Transport of thickened fines and coarse rejects by truck or pumping to in pit emplacement areas where they will be co-disposed, covered by spoil material and progressively rehabilitated;
- Construction of new mine infrastructure facilities including workshop, offices, bath house complex, fuel and lubrication storage areas, vehicle hardstand and road network to support these facilities;
- Construction of a temporary contractor site accommodation complex, to house up to approximately 150 people;
- Closure of a section of the Leard Forest Road and the subsequent upgrade of the surrounding road network as deemed necessary;
- Construction of an overpass on Therribri Road across the existing haul road (if the rail spur is not constructed) when production reaches 5.5 Mtpa saleable coal; and
- Construction of a water management system including sediment dams and other water holding dams and associated infrastructure including pipes and pumps.

The above described production increase and related infrastructure construction works will occur in a staged approach as can be justified by economic drivers. A summary of the status of works currently approved and relating to the Project are included in **Table 6** and shown in **Figure 8**.

The Project seeks to uncover via open cut mining methods up to 7 Mtpa of product (thermal and metallurgical) coal from within its current mining tenements. The Project will extract coal resources down to the Merriown coal seam via a shovel and excavator operation, with the introduction of a dragline in later years as the mine progresses. The Project is a logical progression of mining of the available and previously identified coal resource within Boggabri Coal's mining tenements.

The conceptual mine plan layout for the Project is shown on **Figure 9** to **Figure 12**, for Years 1, 5, 10 and 21.

As indicated in the below figures mining will continue on from the existing operations to the north-east before changing orientation and progressing in a north-westerly direction towards Leard Forest Road.

Mining will progress into the Willow Tree Range which surrounds the Project's open cut area to the east, north and west. Active mining areas will be shielded by the Willow Tree Range in these directions reducing any visual and lighting impacts.

An OEA will be located to the south within the lease area as mining progresses to the north with a maximum height of approximately RL 395 m. An out of pit OEA will be positioned to the east of the mining void adjacent the Willow Tree Range. The entire mining area will be well shielded in all directions following the completion and rehabilitation of the southern slopes of the OEA. The Mine Disturbance Boundary is shown on **Figure 7** and summarised in **Table 7**.

A conceptual final landform design for the Project (upon completion of mining activities) has been developed to demonstrate that the orderly closure of Boggabri Coal Mine can be achieved following the extraction of the coal resource.

A discussion of the post-mining land use and management of the final voids is provided in **Section 8.15**. It should be noted that there is the potential for a further seven years of mining to the north beyond the Mine Disturbance Boundary and 21 year mine limit at 7 Mtpa which would result in a smaller final void.

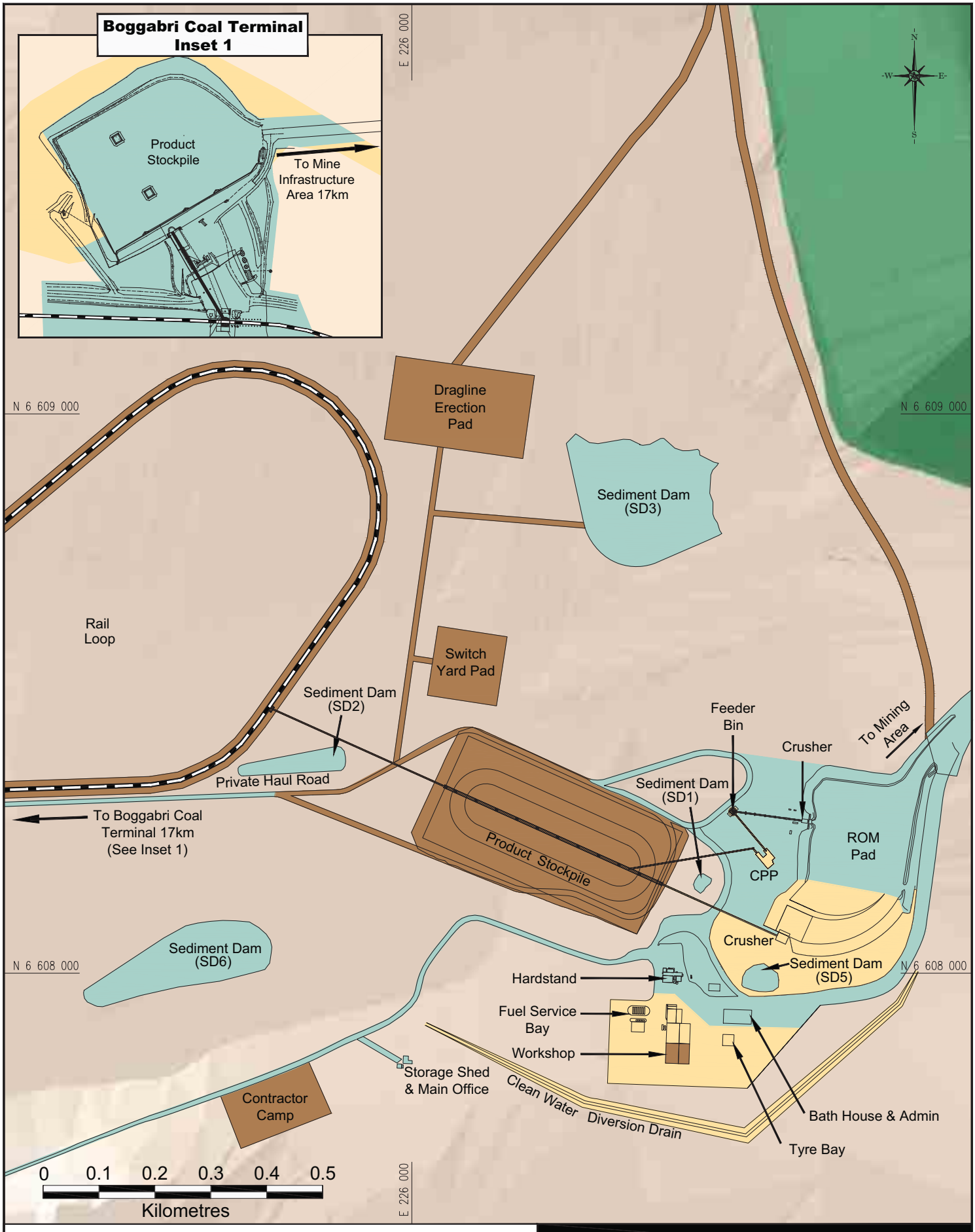
Further to this there is the potential for further open cut mining within the adjacent mining authorities (not held by Boggabri Coal) which could utilise any final void area left by Boggabri Coal. The surface catchment of the final void will be minimised as far as practical by the use of diversion drains and contour banks as required.

Table 6
Work Status

ASPECT	Existing	New Works (prior 2011)	Approved	The Project
MINE PLAN				
Water management structures	yes	yes	yes	yes
Haul roads	1	1	1	1
Dragline and construction pad	0	0	1	1
CPP				
ROM pad	1	1	1	1
ROM hopper	1	0	1	2
Crushing plant	1	0	2	2
CPP, conveyors and auxiliary equipment	0	1	1	1
Tailings dam	0	0	1	0
PRODUCT HANDLING				
Product coal stockpiles and reclaimer	0	1	2	2
Product receival and stacking and stockpile at Boggabri Coal Terminal	1	1	1	1
Second haul road loop	0	1	1	1
INFRASTRUCTURE				
Power supply and substation	1	0	1	1
Fuel Farm tanks	2	3	3	10
Sewerage system	1	1	1	1
Heavy and light vehicle wash bay	1	1	1	2
17 km rail spur and loop	0	0	1	1
Closure of a section of Leard Forest Road	no	no	yes	yes
17 km private coal haul road	yes	no	yes	yes
Irrigation system	yes	yes	yes	yes
BUILDINGS				
Workshop, service bay, bathhouse and office complex	1	1	2	2
Construction camp facility	0	0	0	1

Table 7
Work Disturbance Areas

ASPECT	Existing (ha)	New Works Prior to 2011 (ha)	Approved (Boggabri EIS and SEE) (ha)	The Project (ha)
Rail spur, Rail Loop and Private Haul Road	34.0	0.0	68.0	68.0
Mine disturbance area	385.0	88.0	1,176.0	1,835.0
Infrastructure areas including office, bath house, workshop, wash bays etc	35.0	8.0	45.0	51.0



Existing Infrastructure
Additional Works up to Nov 2011
New Project Infrastructure
Rehabilitation

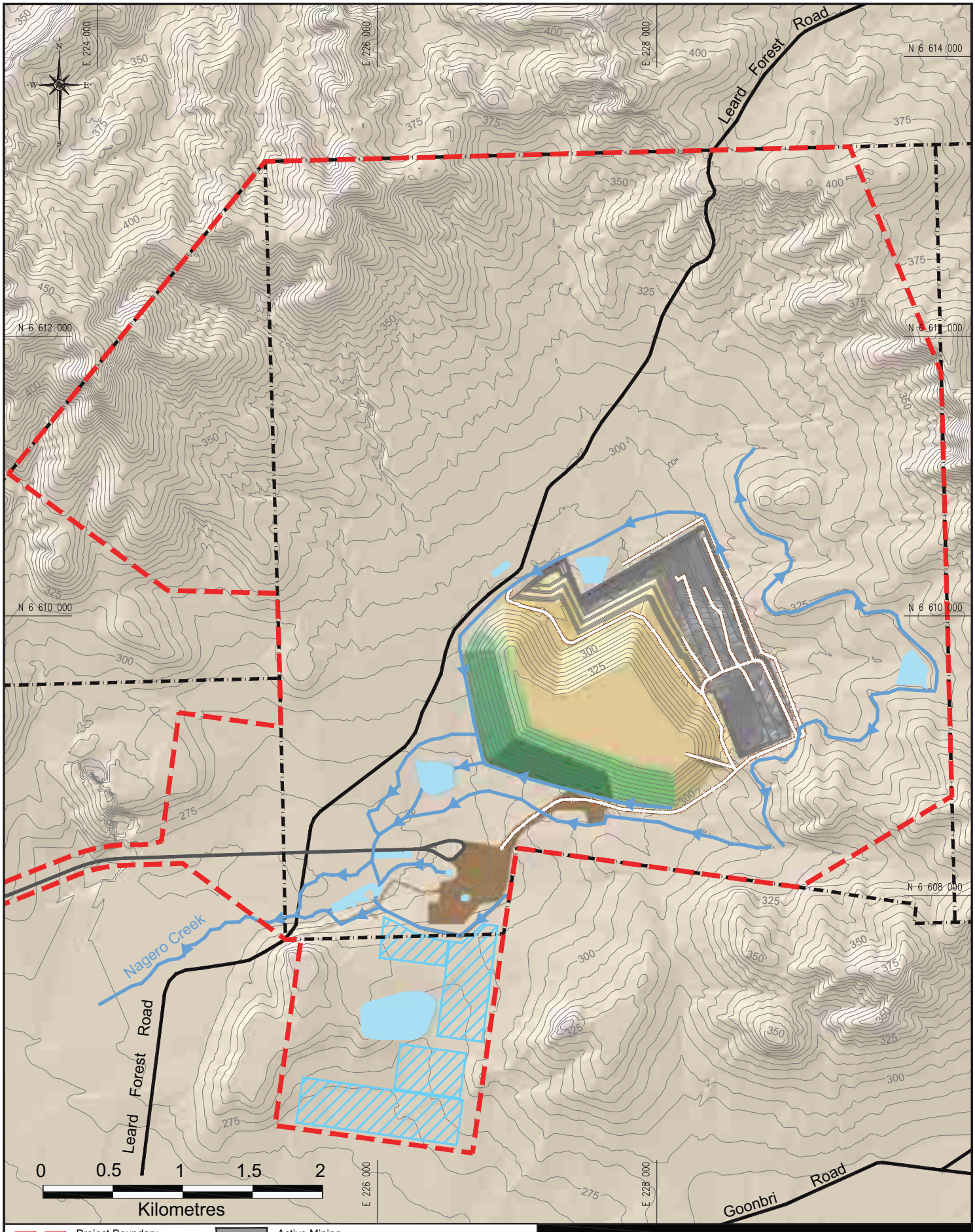
* The location of specific elements of this plan may vary

Source: SEE (2009), EIS (1987), Boggabri Coal (2010)

BOGGABRI COAL MINE

Indicative Project Infrastructure

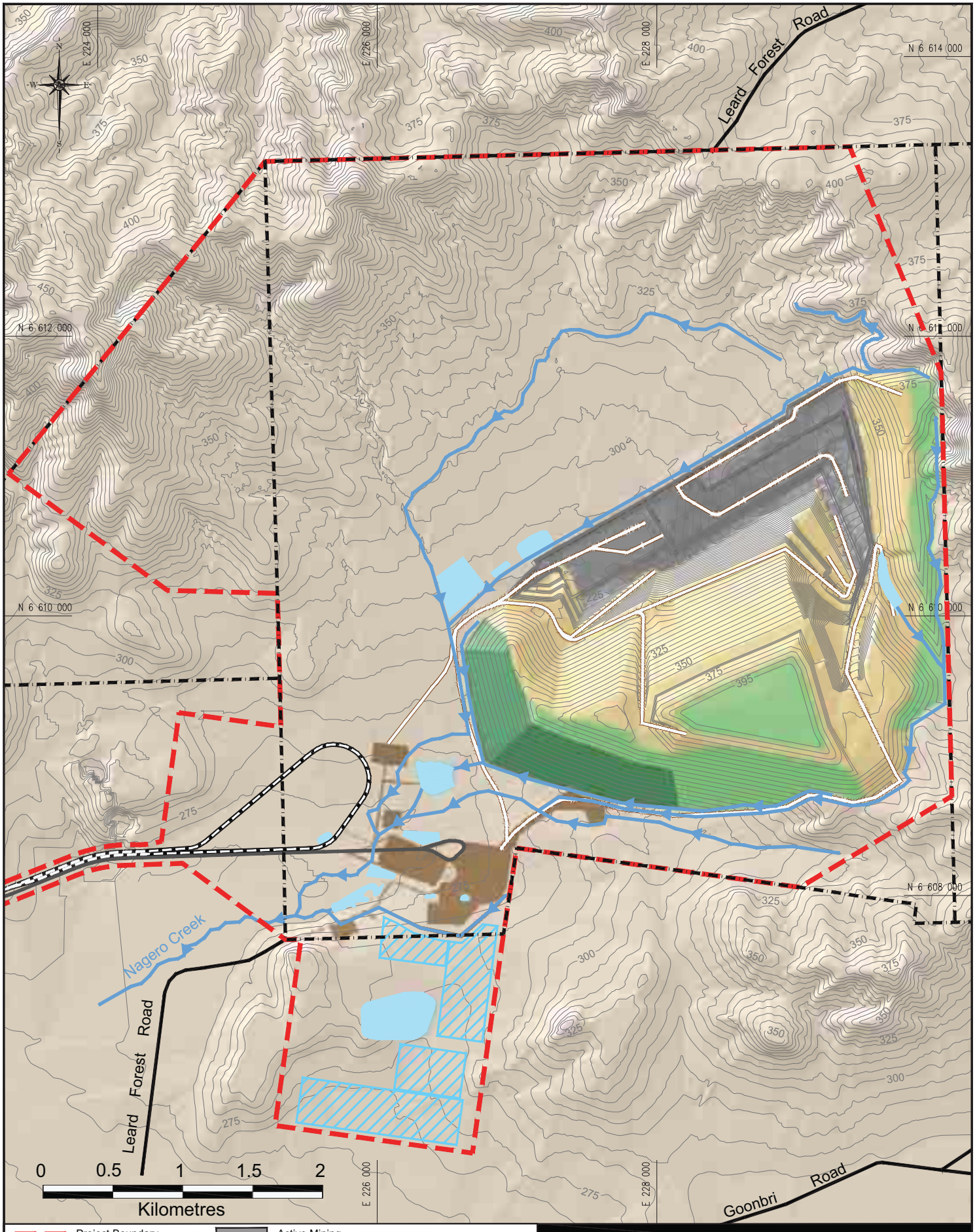
Cad File: 06072C.dwg	Date: 07.04.2010	Drawn: JD	Figure 8



BOGGABRI COAL MINE

Conceptual Year 1 Mine Plan

Cad File: 06043G.dwg	Date: 21.06.2010	Drawn: CP	Figure 9



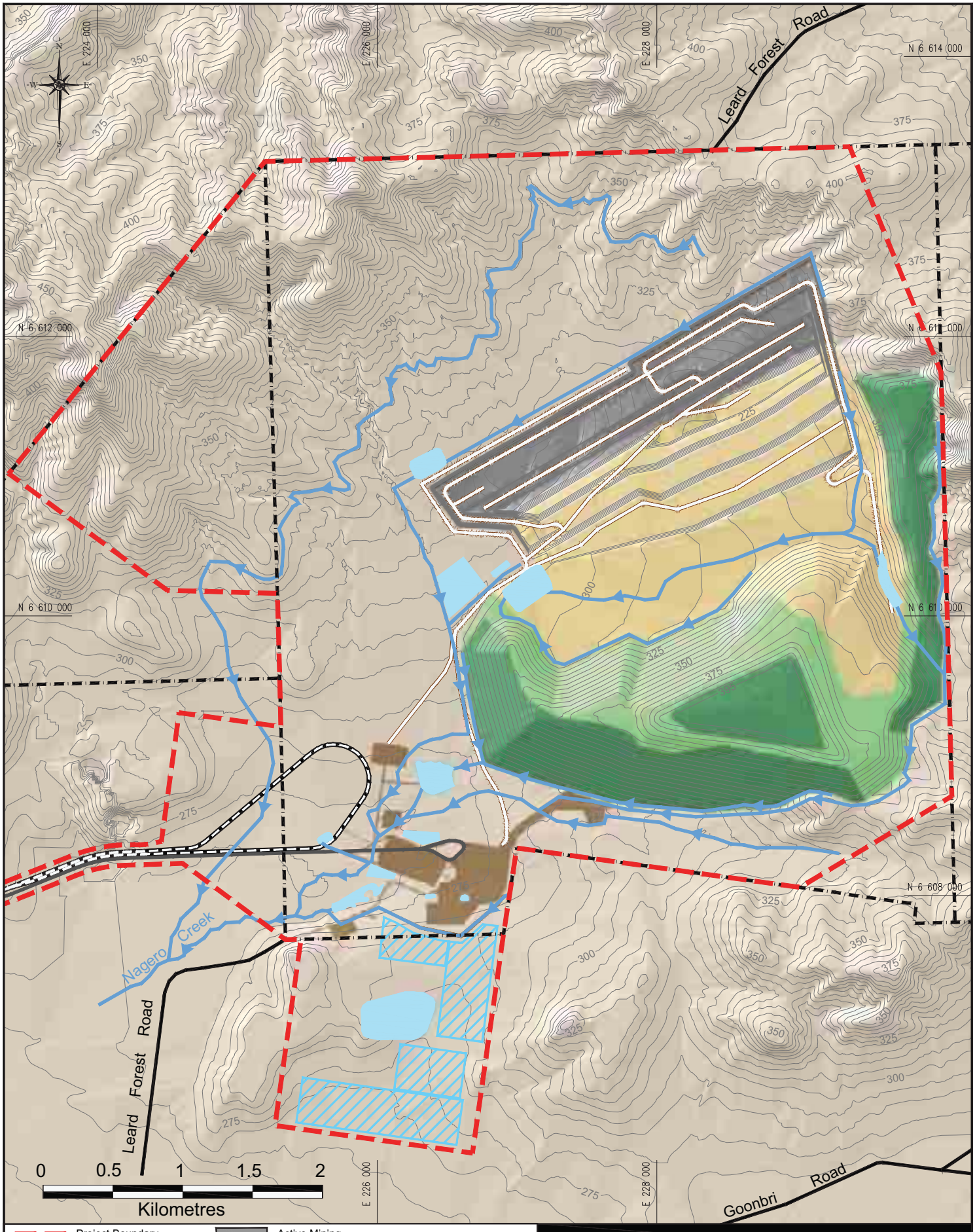
Project Boundary
Boggabri Mining Tenements
Roads
Drainage
Indicative Railloop
Private Haul Road
Indicative Haul Routes
Proposed Infrastructure Area
Active Mining
Spoil
Water Storage
Irrigation Areas
Existing Rehabilitation
Proposed Rehabilitation

Source: Boggabri Coal (2010)

BOGGABRI COAL MINE

Conceptual Year 5 Mine Plan

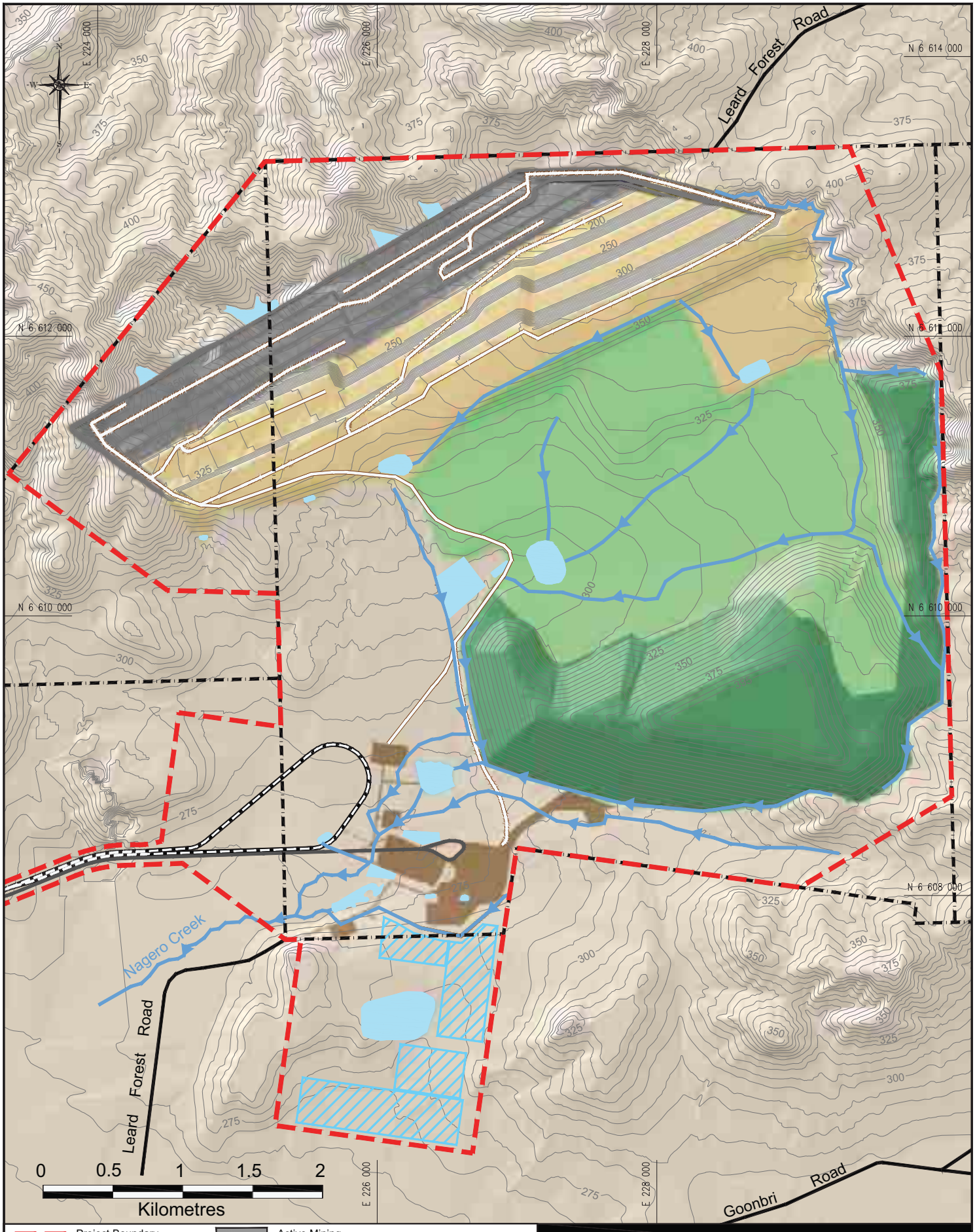
Cad File: 06045G.dwg	Date: 21.06.2010	Drawn: CP	Figure 10



BOGGABRI COAL MINE

Conceptual Year 10 Mine Plan

Cad File: 06046G.dwg	Date: 21.06.2010	Drawn: CP	Figure 11



- Project Boundary
- Boggabri Mining Tenements
- Roads
- Drainage
- Indicative Railloop
- Private Haul Road
- Indicative Haul Routes
- Proposed Infrastructure Area
- Active Mining
- Spoil
- Water Storage
- Irrigation Areas
- Existing Rehabilitation
- Proposed Rehabilitation

Source: Boggabri Coal (2010)

BOGGABRI COAL MINE

Conceptual Year 21 Mine Plan

Cad File: 06048G.dwg	Date: 21.06.2010	Drawn: CP	Figure 12

4.1.1 Mining Schedule and Method

An indicative open cut production schedule for the Project is outlined in **Table 8**. The conceptual open cut mining schedule for the Project involves a gradual increase in product coal levels until maximum production rates (i.e. 7 Mtpa) are achieved by approximately 2017. The Project will remove up to 145 Mt of ROM coal and produce up to 135 Mt of product coal over the 21 year approval period. Up to 980 Million bank cubic metres of overburden will be moved and approximately 10 Mt of coal reject material will be produced from the CPP over the 21 year approval period. The production schedule ultimately realised will be dependent on market drivers over time.

The Project will continue to involve a shovel and excavator operation supported by a truck fleet to transport coal to onsite coal processing and transport facilities. In approximately Year 10 or when economically viable a dragline may be introduced to increase productivity.

Minor infrastructure associated with day to day mining operations, including topsoil stockpiles, sediment control, power supply sub-lines and sub-stations will be constructed ahead of mining within the Project Disturbance Boundary as required.

4.1.2 Blasting

Overburden and interburden will require blasting to achieve satisfactory fragmentation for optimum productivity of digging equipment. Overburden and interburden typically comprise conglomerates (69%), sandstone (22%) and siltstones (9%). Experience to date indicates that a powder factor of 0.62 kg/m^3 will be required for buffer blasting.

Cast blast powder factors for a dragline operation may vary from this.

4.2 INFRASTRUCTURE

4.2.1 ROM Coal Handling

ROM coal will be delivered by haul trucks from the mining area directly to the ROM stockpile for later feeding to the crushing system by front end loader.

The ROM stockpile will enable flexibility to manage variations in coal quality and / or the production schedule. A temporary ROM field stockpile within the open cut mining area may be utilised for temporary storage from time to time as required. It is anticipated that less than five percent of ROM coal would be temporarily stored in a ROM field stockpile.

Following the construction of the CPP (discussed further in **Section 4.2.2**) uncrushed ROM coal will be delivered by haul trucks to one of the following:

- The ROM coal stockpile for processing through the CPP;
- A ROM coal field stockpile adjacent to active mining;
- The bypass ROM coal hopper; or
- The ROM coal stockpile for later rehandling through the bypass ROM coal hopper.

The management of ROM coal will depend on coal quality and the production schedule requirements at the time of mining. Any coal delivered to the ROM coal field stockpile will be rehandled to the ROM coal stockpile for later processing through the CPP or direct to the Bypass ROM coal hopper and loaded onto product coal haul trucks and / or product stockpile.

Table 8
Indicative Production Schedule

Project Year	Total Overburden (Mbcm)	ROM Coal Total (Mt)	Product Coal (Mt)	Course Reject (Mt)	Tailings (Mt)
Year 1	18.87	2.50	2.50	0.00	0.00
Year 5	59.89	8.57	6.97	1.28	0.32
Year 10	45.42	7.89	7.00	0.71	0.18
Year 21	47.08	7.23	7.00	0.19	0.047

Crushing Plant

The existing coal crushing plant located adjacent the ROM coal pad will continue to be used as part of the Project to crush ROM coal. Following construction and commissioning of the bypass crushing plant, the existing coal crushing plant will be modified to be the feed system for the CPP. Further, the truck loading bin will be modified to act as a surge bin to control feed into the CPP.

Bypass Crushing Plant

A bypass crushing plant will be constructed to the south of the ROM coal pad. The bypass crushing facility will receive coal direct from the mining area, ROM coal field stockpile or ROM coal pad. The bypass crushing plant will provide for higher grade ROM coal with coal quality characteristics consistent with product coal to be loaded directly onto haul trucks or trains without passing through the CPP. The crushing plant will comprise the following:

- A ROM coal hopper of at least 350 t capacity with a 1,000 mm grizzly for receiving coal direct from haul trucks;
- A nominal 1,250 tph feeder for delivering ROM coal to the primary crusher;
- A nominal 1,250 tph secondary / tertiary crushing system producing a 50 mm product;
- A nominal 1,250 tph product conveyor;
- A Coalscan, belt weight measure and metal detectors located on the product conveyor;
- A bypass product bin of at least 550 t capacity suitable for loading over size road trains; and
- An overflow stockpile for stockpiling product coal as required.

A diversion arrangement will be installed within the bypass crushing plant circuit to divert high ash product detected by the Coalscan unit to the CPP ROM coal handling system for processing and washing.

4.2.2 CPP

A CPP will be constructed to improve coal quality enabling Boggabri Coal to meet market demands. The CPP will add value to the resource and provide further overall operational flexibility to the mine enabling alternative markets to be considered. This will in turn ensure the long term viability of the Project.

After ROM coal has passed through the coal crushing system as described in **Section 4.2.1**, the CPP feed conveyor will receive crushed coal from the feed surge bin at a nominal rate of up to 500 tph. The feed conveyor will deliver raw coal into the CPP feed hopper.

The CPP will be heavy medium cyclone module and spirals technology for processing coal. The nominal plant feed rate will be approximately 500 tph. All capacities will be validated during detail design of the CPP.

Coal will be fed from the CPP feed hopper to the desliming screen feed box. Feed coal will then be slurried in the desliming screen feed box and fed onto a desliming screen. Material will be collected and flushed to a dense medium cyclone (DMC) feed sump. Mixed dense medium and coarse coal from the DMC feed sump will be pumped into a single DMC.

Product coal and coal medium will overflow from the cyclone and discharge directly to a screen feed box that will distribute the flow onto a product drain and rinse screen. Product coal will be discharged from the end of the drain and rinse screen into the product centrifuges for dewatering and then discharged onto the product conveyor.

Reject and medium will underflow from the cyclone into the reject drain and rinse screen feed box from where it will be distributed onto the reject drain and rinse screen. Reject material will discharge onto the rejects conveyor for transfer to the rejects bin.

The desliming screen undersize (-1.4 mm) will gravitate to the desliming cyclone feed sump and will be pumped to the desliming cyclone cluster. The cyclones will classify the fine coal feed at approximately 0.125 mm and the underflow will gravitate to the triple start spirals banks.

Desliming cyclone overflow will gravitate to the tailings thickener for process through a band press filter system. The spirals product will be collected in the spirals product sump and pumped to the spirals thickening cyclone cluster. The thickened underflow will be fed into the fine coal centrifuges, which will dewater the fine product and discharge onto the product conveyor.

Desliming cyclone overflow will gravitate to the tailings thickener. Flocculants will be added to the thickener feed launder to assist settling of the tailings prior to discharging into the feed well of the tailings thickener. Clarified water will overflow the thickener into the clarified water tank and will be recirculated through the plant as required. The tailings thickener underflow will be combined with the spirals reject and pumped to the tailings disposal hopper and transported back to the mining area for disposal.

The installation of an ultra fines plant as part of the CPP construction will facilitate the reprocessing of fines to further minimise waste and increase water recycling in the plant.

The above description is a general representation of the CPP that will be constructed as part of the Project.

While the overall description of the coal process is accurate the specific details of the process may vary following detailed design and the emergence of new technologies.

4.2.3 Product Coal Handling

A product coal stockpile will be constructed adjacent the ROM coal pad with a nominal capacity of up to 600,000 t. A product stockpile will allow for greater flexibility in the handling and managing of coal demands within the "Coal Chain" for delivering product coal onto ships at the Port of Newcastle. The stockpile will allow for loading coal directly onto trains following the construction of the rail spur and loop. Dozers would be used to manage coal on the stockpile.

The reclaim system will comprise the dozer(s) on the stockpile and an underground reclaim feeder system within a reclaim tunnel. The reclaim feeders will feed a conveyor with a nominal capacity of 5,000 tph.

Product reclaimed from the product stockpile will report to a Truck Loading Bin or to the Train Loadout facility following the construction of the rail spur and loop.

The CPP product conveyor will have a nominal capacity of 500 tph and will transfer washed product to a washed coal bin with a nominal 575 t capacity. The washed coal bin will be located adjacent to the CPP feed bin. The bin will have a bypass chute to facilitate stockpiling of coal as required. Any coal reporting to the stockpile will be retrieved by front end loader for loading into the over size haul trucks.

Following the construction of the product stockpile and rail spur and loop, CPP product will be delivered to the 600,000 t capacity stockpile.

4.2.4 Rail Spur and Loop

A rail spur linking the mine to the main rail line adjacent the Boggabri Coal Terminal will be constructed when production levels increase. Various factors including the economic viability to confirm the feasibility of hauling coal via rail compared to truck haulage to the Boggabri Coal Terminal will be assessed.

The rail spur will be approximately 17 km in length and aligned in a generally east to west direction. The rail easement is located on property owned by Boggabri Coal and crosses the Namoi River floodplain, as well as the National Stock Route, Kamilaroi Highway and Therribri Road. Coal would continue to be transported by truck haulage from the site until the rail spur, loop and associated infrastructure are operational.

The location of the connection point will enable faster entry and exit turnout speeds for locomotives and minimise track length as far as practical.

The rail spur will be designed to meet Australian Rail Track Corporation (ARTC) standards. The rail spur will connect to the main north-west rail line adjacent the existing Boggabri Coal Terminal. A high speed turnout from the main line has been incorporated (enabling exit from / entry to the main line at 60 kph).

A maximum grade for loaded trains travelling uphill of 1% has been targeted and 2% for unloaded trains.

Curves in the track have been maximised with the loop diameter of 500 m, noting that a train will be travelling through this portion of the line at less than 10 kph.

The horizontal alignment of the track has been developed to balance cut and fill requirements and drainage. The vertical alignment has been developed similarly and ensures adequate drainage structures below the track and formation.

The most significant feature of the rail link will be the Namoi River floodplain crossing, which is approximately 1.4 km long. A rail gantry will span the length of the floodplain and has been designed above the 1 in 100 year flood level.

Signalling on the main line as well as in the spur line will be controlled (centrally) from the Broadmeadow control centre. All signalling is designed to meet ARTC guidelines and the Boggabri yard signalling will also accommodate the new mainline turnout.

The private haul road will be used as a service corridor for the rail line where practical and will be maintained for mining related activities.

The Namoi River floodplain is approximately 1,400 m wide where the rail spur crosses the floodplain and Kamilaroi Highway. Based on flood studies undertaken it was determined that an opening of 1,100 m would be required to minimise potential impacts during flood events. As such the design of the viaduct supporting the rail line across the floodplain has taken this into consideration. The freeboard height of the deck structure of the viaduct is designed to be at least 0.5 m above the 100 year floor level.

The viaduct will cross the Kamilaroi Highway, Namoi River and Therribri Road which are all located on the Namoi River floodplain and within the 1 in 100 flood level.

The design of the bridge over the Namoi River will be a triple span bridge design and will form part of the viaduct. Spillage trays or equivalent design features will be incorporated below the bridge to provide for a suitable environmental outcome where the rail line crosses the Namoi River.

4.2.5 Buildings and Services

Workshop

An additional two bay workshop will be constructed taking the total number of workshop bays to six for the Project. Workshop bays will be designed with sufficient height to allow the raising of the tray of the largest rear dump truck envisaged (CAT 797 size).

Bathhouse and Office

Additional bath house and office facilities will be constructed in a manner consistent with previously established buildings to meet increased demand as production increases.

Fuel Farm

Diesel fuel will continue to be delivered to site by road transport. Additional self bunded fuel tanks will be installed adjacent the fuel bay to accommodate increased demand as production increases. Self bunded fuel tanks will be installed adjacent the Boggabri Coal Terminal and proposed rail loop for the purpose of refuelling trains and auxiliary equipment.

Vehicle Wash Bay

Heavy vehicle wash bays to accommodate mining vehicles will be constructed and form part of the Project. Wash bays are used to prepare vehicles for entry to the workshops as well as reduce their 'dead load'. This facility will accommodate the haul trucks (both overburden and coal haulage), dozers, graders, and rubber tyred loaders.

Mud, grease and oils removed from the vehicles will be caught by a drive-in sump capable of being cleaned out by a front end loader. Following settlement and separation of the mud from the hose down water, the water will then be put through an oil separator unit and reused onsite. Water used at the heavy vehicle wash down bay will be treated water or dirty (coal contact) water.

Sewerage

Sewerage system upgrades will be required to accommodate the additional permanent and construction workforces.

Power

The Project will include electricity demands of up to 38 Megavolt-amperes with the introduction of electric shovel(s) and a dragline. The preferred required additional power supply is from the TransGrid 132 kV line passing to the west of the Project Boundary. The Project will include the construction of a 132 kV line to provide the increased power requirements to the mine.

The easement for the power line will be located within the Project Boundary where environmental assessments have been completed. The general alignment of the power line will follow the existing haul road and rail spur from the Kamilaroi Highway to the mine infrastructure area. The detailed design of the power line will avoid placing footings in environmentally sensitive areas that contain any known archaeological sites.

Sub Station

The mine substation will be located adjacent the mine infrastructure area to compliment the upgraded power supply. This will provide ready access for power to mining equipment including the dragline and electric shovel. The substation will have the capacity to transform the supply power voltage down from 132 kV to 11 kV for distribution onsite in the mine infrastructure area. The substation area will be fenced for security and will have earth matting installed.

Communications

An optical fibre cable or radio communications will be installed to improve access to communications networks. An onsite communications tower will be constructed to provide a base for localised site communications networks such as two way radios and automated vehicle tracking systems. The tower will be located to provide line of site between the mining and infrastructure areas.

Fire Services

Fire services will be incorporated in the CPP in the form of stand pipes and hose reels. A deluge system will be included for the main switchyard transformer and will form part of the Project.

Water storage tanks will be installed to supply the water requirements for the fire suppressant services which will include dedicated pumps and diesel backup power to provide the flow and pressure for the system.

4.2.6 Leard Forest Road Closure / Relocation

Consistent with DA 36/88 a section of Leard Forest Road will be intersected by mining activities. Any relocation works or upgrades required as compensation for the closure of Leard Forest Road will be undertaken prior to its closure in consultation with the Narrabri Shire Council (NSC).

4.3 INDICATIVE EQUIPMENT FLEET

Table 9 includes the indicative equipment fleet required for Year 1, 5, 10 and 21 of the Project.

4.4 COAL TRANSPORTATION

The Project will require additional coal transport and loading infrastructure to manage the increased export coal production up to 7 Mtpa, with the construction of a Rail Spur and Loop and associated loading conveyor systems (discussed in **Section 4.2.4**).

All export product coal will continue to be transported via truck haulage along the existing private haul road until the construction of the rail spur, loop and associated infrastructure is completed. The rail spur and loop will be constructed to increase coal transportation capacity and efficiencies when commercially viable.

Rail Transportation

A rail spur and loop may be constructed for the transportation of coal from the mine site to the Werris Creek Mungindi Railway Line as discussed in **Section 4.2.4**. It is anticipated that there will be an average of five to six train movements per day at full production (note: each train entering and exiting the Rail Loading Facility is classified as two train movements).

ARTC have advised that they can provide adequate rail capacity to meet the proposed increase in coal production for the Project (**Appendix E**).

Total rail capacity may be increased by track upgrading, improved rail network over the Liverpool Ranges and additional passing loops. This will permit an increase in wagon axle load capacity up to 30 t (8,500 t train size) from the current 25 t axle load limit (6,000 t train size).

The introduction of larger capacity trains would also reduce the number of movements. Ongoing investigations and assessments to improve rail transport capacities are being undertaken by ARTC to increase the capacity of the Werris Creek Mungindi Rail Line.

Table 10 shows the anticipated train sizes and movements per day for the Project. This assumes the rail capacity is available for the transport of up to 7 Mtpa and relevant track upgrades are completed to provide access for larger capacity trains.

At a production level of 7 Mtpa, there will be an average of five to six train movements through Boggabri per day. However, the number of train movements is proportional to train size and will be dependent on relevant track upgrades as discussed above. The estimated average train length would vary from 1.45 km up to 1.53 km in length.

Table 9
Indicative Mobile Equipment List

Equipment	Year 1	Year 5	Year 10	Year 21
Dragline	0	0	1	1
Electric Face Shovels	0	1	1	1
Excavators	4	6	6	7
Trucks	14	36	35	43
B-double Trucks	3	8	8	8
Front End Loader	1	3	2	2
Graders	2	6	5	6
Bulldozers	8	16	15	18
Rubber Tyre Bulldozers	1	3	2	2
Watercarts	2	5	4	4
Drills	2	8	7	7

Table 10
Train Movements

Year	Product Coal (Mtpa)	Train Movements / day*	No. of Carriages	No. of Locomotives	Train Length (m)
Current	1.5	1.5	72 (5,400 t)	3	1,275
Approved	5	2.6	84 (4,500 t)	3	1,487
Year 1	2.5	2.4	72 to 80 (5,400 t to 6,000 t)	3	1,275 to 1,300
Year 5	7	5.5	80 (7,000 t)	3	1,300
Year 10	7	4.5	91 (8,500 t)	3	1,450 to 1,530
Year 21	7	4.5	91 (8,500 t)	3	1,450 to 1,530

** 365 days per year, includes loaded and empty train movements*

4.5 REJECT AND TAILINGS DISPOSAL

The coarse reject conveyor will deliver dewatered coarse rejects from the heavy medium cyclone circuit to the coarse rejects storage area. The coarse reject storage area will provide a storage buffer prior to loading into CAT 785 size rear dump trucks. The reject storage area will be accessible by a haul road connected to the mine haul road network for transport to the open cut mining area.

Tailings will have increased viscosity following treatment in a thickening unit and the possible installation of an ultra-fines plant. Belt filter press technologies will be utilised as and when required to assist in dewatering and conditioning slurry prior to transporting to the temporary tailings emplacement area for co-disposal.

Thickened tailings will be pumped or trucked to a tailings emplacement area which will be located within the open cut mining area. The tailings emplacement area will migrate over time with the advancing open cut operations and co-disposed with spoil material facilitating the regular rehabilitation of tailings emplacements. Temporary evaporation ponds may also be constructed to dry tailings waste prior to it being transported and for co-disposal within the mining area.

The proposed coarse reject and tailings disposal strategy provides adequate disposal options and capacity for all coal waste produced throughout the life of the Project whilst contributing to mine rehabilitation outcomes.

4.6 WATER MANAGEMENT

The existing water management system will be progressively augmented as water management requirements change over the Project life. **Figure 9**, **Figure 10**, **Figure 11** and **Figure 12** illustrate the indicative drainage requirements for the Project and proposed catchment dams to reduce runoff and runoff velocity.

Water from coarse and fine reject material will be reclaimed for re-use in the water management system. Water recovered from the open cut operation will continue to be pumped to mine water storages and will also be used in the CPP and for dust suppression.

During abnormally wet periods leading to an excess of water being generated onsite (when the total water storage is in excess of what is required for usage) water will be used for irrigation purposes prior to further excess water being held in the mine void. During abnormally dry periods water will be pumped from the Namoi River via a pumping station and pipeline between the Namoi River and infrastructure area (see **Figure 6**).

Water will be extracted in accordance with conditions of water access licenses (WAL): WAL2571, WAL2595, WAL2596 and WAL2572. In addition to the Namoi River licences two groundwater extraction bores will also be available for dust suppression operations.

Runoff from haul roads, hardstand and pre-strip areas will either be directed to existing mine water storages (where feasible) or will be captured in sediment retention storages sized to trap silt and other material which easily settle. Water in the sediment dams may be used for dust suppression around the mine. Sediment dams will be generally sized in accordance with the *Managing Urban Stormwater Guidelines,* Landcom (2004).

Runoff from workshop, industrial and vehicle re-fuelling areas, which has the highest potential to contain elevated hydrocarbons, will continue to be captured in downslope dams and recycled within the mine water management system. Treated sewerage effluent will be reused onsite.

Runoff from rehabilitated and revegetated areas will be directed to mine water storages or be directed to sediment retention storages prior to being reused or allowed to drain to local natural drainage lines. These areas will be allowed to free drain as the landform becomes sustainable.

4.7 HOURS OF OPERATION AND EMPLOYMENT

A total workforce of up to 500 full time equivalent employees will be required at the Boggabri Coal Mine at peak production, which represents an increase of approximately 355 employees from current staffing levels.

In addition workforce requirements for the construction of site infrastructure are unlikely to exceed 150 full time equivalent employees. Construction activities will be undertaken in a staged approach and therefore the construction workforce numbers will be staggered. Maximum levels of full time equivalent employees will not be reached whilst a substantive construction workforce is onsite.

Construction, coal mining and associated activities relating to the Project will be undertaken up to 24 hours per day, seven days a week.

4.8 LEARD FOREST ROAD CLOSURE

The southern and northern sections of Leard Forest Road would remain open for public use. The section of Leard Forest Road proposed to be closed would remain open until mining activities intercept the road. The Project will require the permanent closure of a section of Leard Forest Road in its current location as mining progresses to the north-west.

It is anticipated that a 6 km section of Leard Forest Road would be permanently closed from the intersection with the mine office entrance gates to the northern limit of the Project Boundary. The road would be closed when the risk to public safety was identified as being too high through a public risk assessment process.

In the mean time Leard Forest Road will be closed on a temporary basis as a consequence of blasting and other mine related construction activities in accordance with the Boggabri Coal road closure procedure which will form part of the Blast Management System. Temporary road closures will vary on a daily basis depending on the mine schedule and construction works program.

A traffic impact assessment for the Project was completed which has concluded that there would be no adverse impacts relating to the capacity or safety of the road network due to the closure of a section Leard Forest Road, this is discussed further in **Section 8.19**.

4.9 CONSTRUCTION PHASE

The construction of Project related infrastructure will occur in a staged approach generally over the first 10 years of the Project and is shown in **Table 11**.

Table 11
Indicative Construction Schedule

Aspect	Before Year 1	Year 1	Year 5	Year 10	Year 21
MINE PLAN					
Mine haul road extensions					
Water management structures					
Introduction of a dragline					
Dragline construction pad					
In pit ROM pad					
CPP					
Expansion of existing ROM pad					

Aspect	Before Year 1	Year 1	Year 5	Year 10	Year 21
Bypass ROM hopper					
Bypass Crushing Plant					
Bypass Product Bin and Stockpile					
Modification of truck loading bin to a surge bin to control feed to CPP					
CPP Feed Conveyor					
CPP					
Coarse Reject Conveyor					
Coarse Reject buffer storage area					
Tailings Emplacement					
PRODUCT COAL HANDLING					
Rail Spur and Loop					
Washed Product bin and Stockpile					
CPP Product Conveyors					
Product coal stockpile up to 600,000 t capacity					
Product stockpile reclaim					
Product Stockpile at Boggabri Coal Terminal					
Second haul road loop					
Product loadout modifications					
INFRASTRUCTURE					
Mine substation					
Upgrading mine power supply to 132 kV					
Fuel Farm					
Sewerage system upgrade					
Heavy Vehicle Wash Bay					
Light Vehicle Wash Bay					
Main water storage dam					
Closure of Leard Forest Road					
Therribri Road overpass					
Upgrading / widening of private coal haul road					
BUILDINGS					
Workshop					
Service Bay					
Contractor Camp Facility					
Bathhouse and Office Upgrade					

4.10 INTERACTIONS WITH EXISTING APPROVALS AND OPERATIONS

The Project is the continuation and extension of the existing approved mining operations at Boggabri Coal Mine. The major interactions of the Project with existing, approved operations include:

- Continuation of the same approved mining method (including approved but not yet implemented flexibilities such as the rail spur and loop, CPP and a dragline described in the Boggabri EIS) utilising additional equipment and personnel to achieve an increased rate of production;
- Logical progression of the mining area from the approved open cut disturbance boundary;
- Use of existing infrastructure facilities with additional upgrades and modifications proposed to accommodate the increased production levels sought. Interactions with approved infrastructure will include the upgrade and ongoing use of the product coal haul road, coal storage, handling and transport systems, road infrastructure, water management systems, workshops, storage and administration facilities;
- Utilisation of the existing Boggabri Coal Terminal with increased stockpile capacity to allow increased export of coal (up to 7 Mtpa) to the Werris Creek Mungindi Railway Line. This will be on sold or decommissioned following the construction of the rail spur and loop as or when required;
- Use of the existing water management system which will be upgraded to support the Project; and
- Closure of a section of the Leard Forest Road as discussed in **Section 4.2.6**.

On 20 November 1978 the Boggabri Project was designated by the Commonwealth Minister for Trade and Resources pursuant to the *Environment Protection (Impact of Proposals) Act 1974* (EPIP Act).

Development Consent for the Boggabri Coal Project was originally issued by the Minister for Planning under Part 4 of the EP&A Act on 25 August 1989 (Boggabri Existing). Boggabri Existing is described in the original planning approval and supporting Boggabri EIS and forms part of the Project (see **Figure 6**).

The Minister for the Environment advised by letter dated 8 March 2005 that the transitional provisions of the *Environmental Reform (Consequential Provisions) Act 1999* (ERCP Act) applied meaning that the Boggabri Project which was assessed under the EPIP Act did not require assessment under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). By letter dated 10 December 2009 the Assistant Secretary of the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) advised that *"referral and approval of the existing Boggabri Coal Project is not required under the EPBC Act"* (see **Appendix D**). The area of the Project that falls outside 'Boggabri Existing' (and was not assessed under the EPIP Act and therefore where the ERCP Act does not apply) requires assessment under the EPBC Act. This area is referred to as 'Boggabri Extension' throughout this EA (see **Figure 6**).

4.11 PROJECT NEED

Project Approval is required to maximise the recovery of the additional coal reserves known to occur within Boggabri Coal's existing mining leases, whilst minimising environmental and social impacts resulting from the Project.

An additional opportunity to produce saleable coal at an increased production rate will provide Boggabri Coal the flexibility and confidence to invest in substantive capital enhancements to the Project so that it is able to respond to unpredictable economic circumstances while maintaining the effective management of impacts. This will improve general operational and energy efficiencies.

The Project is a logical progression of the existing mining operation which will maximise the viable recovery of the known coal resource.

The existence of the already established mining operation facilitates this natural progression of mining in the area. This is consistent with the intent of the original Development Consent which came into force following the issuance of a Mining Lease in 1990 for a period of 21 years. It is forecast that demand for steaming coal will remain strong in the medium term at least.

To support enhancements to the NSW coal chain users were required in commit to 'take or pay' contracts in early 2010. These contracts have provided certainty to the utility owners for billions of dollars of much needed investment in the NSW rail and coal port facilities. Boggabri Coal has had no alternative but to enter into port contracts for the supply of coal to meet the forecast production for the Project. The Project Approval is required so that Boggabri Coal can meet this commitment.

The importance of future coal mining and the Project in the Narrabri Shire is recognised in the draft Narrabri Shire Growth Management Strategy (GMS), and considerations provided for in the revised Local Environmental Plan (LEP).

The GMS has recognised opportunities associated with the emerging mining industry and has recommended that provisions within the LEP encourage the development of coal projects within the Narrabri LGA. As such, the revised LEP provides for the rezoning of lands to 2 (a), 2 (b) and 2 (c) surrounding the township of Boggabri for additional housing developments to support the accommodation needs anticipated from future mining developments.

Further to the above, the need for the Project is demonstrated by the substantial net economic benefit it will realise to the local community, Narrabri Shire, along with the State and Federal Government.

Boggabri Coal will employ a total workforce of up to 500 full time employees for the operation, with a further 150 full time equivalent contractors required during the construction phase of the Project.

The recovery of an additional 135 Mt of export quality coal from the continuation of mining at Boggabri Coal Mine will also result in a significant increase in royalty payments to the State of NSW and export earnings for Australia.

In summary, the need for the Project exists in two broad groups of issues which:

- Arise from the inherent need for the economic benefits which the Project brings to the immediate and broader community; and
- Constitute incremental need arising from the efficiencies and benefits to be derived from the continuation of and extension of an existing large scale mine.

Inherent Need

The international demand for coal is now strong and is projected to remain strong for many years to come.

Coal is one of Australia's main export industries. It brings wealth and prosperity to the community in the immediate locality of the Project (via jobs, economic benefits and other direct benefits to the local community). These benefits are set out in detail in **Section 8.13** and **Appendix Q**.

The need for the Project is to satisfy the demand for coal internationally and to provide economic benefits to the local community and also to the state of New South Wales.

Incremental Need

As described in **Section 3** the existing operations of the Boggabri Coal Mine are extensive. They have involved the construction and development of an open cut coal mine and associated mining and coal transportation infrastructure. The need for the Project is to maximise the development of the resources which have already been committed to the Boggabri Coal Mine.

Additionally, an increase in the scale of operations associated with the Project will bring further efficiencies to the Boggabri Coal Mine (thus reducing, per tonne, the total environmental impact of coal recovered from the Project area).

It will also assist in bringing efficiencies to the entire NSW coal industry by providing part of the throughput for increased capacity in rail and port services.

The Project satisfies the need to satisfactorily remediate and rehabilitate existing mine workings and to improve the ecological biodiversity and environmental outcomes (which are provided for under this Project). In short, the long term environmental outcomes from the Project as proposed will be superior to those which would be experienced from the existing operation under the existing approval.

4.12 PROJECT ALTERNATIVES

Through extensive planning, assessment and operational experience, Boggabri Coal has developed a thorough understanding of the environmental and social constraints to mining. Prior to the finalisation of a detailed mine plan for the Project, several alternatives were considered in satisfaction of the requirements set out in the Director-General's Requirements for the Project. The preferred mine plan was then developed with these constraints in mind, as discussed below.

4.12.1 Option 1

Option 1 involved utilising various combinations of excavator and truck fleets to produce up to 1.5 Mtpa product coal. This option was rejected due to the limited production capacity and higher anticipated market demands failing to satisfy the needs for the Project as described in **Section 4.11**.

4.12.2 Option 2

Option 2 involved the introduction of a dragline supported by an excavator and fleet of trucks from the achievement of 2.5 Mtpa product coal. This option was rejected as it was identified that a dragline would add maximum value to resource extraction at production levels of 5 Mtpa and more. This alternative did not satisfy efficient use of available resources to undertake the Project as referred in **Section 4.11**.

4.12.3 Option 3

Option 3 involved the reliance on the Nagero and the Tarrawonga / Templemore seams as alternative basal seams to the current and approved Merriown seam. This option was rejected due to the significant changes required to the mine plan with little or no economic returns. This alternative failed to take advantage of efficiencies available from utilisation of the existing mine plan and therefore used resources in an inefficient manner.

4.12.4 Option 4

Option 4 included mining within the 'limit of surface mine' as described in the Boggabri EIS. This option was rejected as further drilling identified additional open cut minable reserves to the north-west of CL368. This alternative failed to maximise resource recovery and therefore was not considered to be in satisfaction of the object of encouraging the proper development of natural resources for the purpose of promoting the social and economic welfare of the community.

4.12.5 Option 5

Option 5 involved a larger mining footprint that included the area to the north-west of CL368 and north of A355 which is outside the 21 year mining limit as shown in **Figure 12.** This additional area would include a further 7 years of open cut mining within Boggabri Coal's mining tenements. This option was not progressed as it provided for mining approval for more than 21 years beyond what is seen as appropriate for determining consistency with the objects of the EP&A Act. Approval for access to this resource will be applied for as and when required in the future by subsequent application supported by further environmental assessment as required.

4.12.6 Option 6 Underground Mining

Introduction

WDS Consulting was commissioned to complete a conceptual study to assess the feasibility of progressing Boggabri Coal Mine from November 2011 as an underground coal mine thus reducing the level of surface disturbance. The study developed a conceptual design and evaluation for the recovery of the targeted resource area. Future deeper underground mining areas were not considered as part of the study as they are independent. The Underground Concept Study, 2009 is presented in **Appendix C** with a summary of the report provided below.

Description of Resource

The Boggabri coal resource as described for the Project in **Section 2.2.3** consists of eight mineable coal seams. Of these, three were identified as having economic potential for underground mining including the upper Braymont, Jeralong and Merriown each averaging 4.9 m, 2.5 m and 2.2 m in thickness respectively. A combined total ROM coal reserve of 94.6 Mt (as opposed to 200 Mt via open cut methods) is estimated to be available for underground mining from all three seams. The remaining five seams were not considered economically viable using underground mining methods due to a combination of low seam thickness, safety issues and lack of physical area.

Method of Mining

The underground mine access strategy was developed on the basis of using the projected 2011 face position of the open cut highwall. Three underground mining methods were investigated including, Longwall, Place Change and Wongawilli. The retreat longwall method of mining was identified as the preferred mining method. Conceptually, longwall mining at Boggabri offers the highest resource recovery rate, consistent production rates, is inherently safe and is widespread across Australia. The main downfall to longwall mining is the large initial capital cost required to establish and the significant lead time necessary prior to production achieving economic levels.

Three options for underground mine access were examined including an independent open box cut, establishment of drifts and the utilisation of the existing open cut highwall. The negatives associated with the construction of a box cut or drift were considered too great when compared to the advantages associated with the highwall access option, therefore the study has been confined to open cut highwall access only.

The mine schedule was based on 364 days per annum production, consisting of two 10 hour shifts and a four hour maintenance window. A mine workforce of 263 personnel, made up of 204 underground shift workers and 59 support staff would be required. Total ROM production as a result of this method would have an estimated average of 5.3 Mtpa ROM coal. Recoveries of between 68% – 86% are predicted resulting in an average of 4.0 Mtpa product coal available for export.

Limitations of Underground Mining

While it has been determined that underground mining may be technically and economically viable under certain market conditions, a number of disadvantages have been identified including:

- Only three seams of the proposed eight target seams would be viable for longwall extraction;
- Less efficient deployment of resources in developing the mine;
- The sterilisation of more than 100 Mt of coal resource due to the multi seam nature of the deposit;
- Lower production levels with an average of 5.3 Mtpa ROM coal would provide less social and economic benefit to the community;
- Requirement of all ROM coal to be washed would result in a poorer environmental outcome than open cut mining; and
- The construction of a large tailings dam to manage coal fines and rejects would be a poorer environmental outcome.

A comparison to open cut mining was required to determine the most economically and environmentally sustainable method of mining.

Underground Opposed to Open Cut Mining

Open cut mining can recover a significantly greater proportion of the coal including the thinner seams that are not viable for underground mining. Open cut mining methods will extract coal from eight identifiable seams consisting of numerous splits from the Herndale to the Merriown seam with an estimated total coal resource of 200 Mt. Production levels obtained using the current open cut mine plan will reach a maximum of 7 Mtpa of product coal and employ up to 500 full time equivalent personnel.

While, the concept study identified that the utilisation of underground mining can be technically viable in part of the Boggabri resource, it does not provide the highest recovery of resources at the lower seam depths. In addition, a number of other limitations have been identified above that have resulted in the decision to continue and develop the open cut mine.

The extent of the Boggabri Coal reserves, do however, contain deeper resources where underground mining methodologies could be considered for future operations.

4.12.7 Option 7 - Project Mine Plan

The mine plan as presented in the EA (see **Figure 9, Figure 10**, **Figure 11** and **Figure 12**) has been developed through a series of Studies and Environmental Constraints Analyses.

Boggabri Coal completed a detailed Pre-Feasibility Study for the Project which considered numerous mine plans and operational technologies. The primary objective of the Pre-Feasibility Study was to minimise environmental and social impacts, whilst maximising resource recovery and operational efficiency.

The alternative mine plans generally included production capacities of 2.5 Mtpa to greater than 8 Mtpa. The mine plans were assessed using a range of mining equipment including excavators, truck and shovels and a dragline operation.

Preliminary Environmental Assessment

A preliminary environmental risk assessment was conducted as part of the *Boggabri Coal Mine Preliminary Environmental Assessment* (PEA) September 2009 for the Project.

The PEA also presented the conceptual mine plan and scope in preparation for the EA. As a result of the preliminary risk assessment it was determined that additional studies into the potential noise impacts associated with the Project required further investigation. Recommendations resulting from the additional noise modelling and risk assessment were incorporated by Boggabri Coal into the design criteria for the final mine plans to minimise environmental and social impacts as presented in **Section 4**.

Additional Mine Plan Changes

The mine plan for the Project (see **Section 4.1**) has continually evolved from that presented in the PEA to address environmental, economic and social issues. In particular, the mine plan has since been modified by Boggabri Coal to address the following:

- The proposed clean water diversion drain around Merriown Mountain to the west of the mining area has been removed to avoid known stands of Box-Gum Woodland Endangered Ecological Community (EEC);
- The proposed cutting through a ridgeline to the south-east of the mining area to ensure a free draining final land form has been avoided. The original mine plan as described in the PEA would have required a cutting approximately 15 m deep by 25 m wide to enable clean water to drain freely around the mining area from the east. The final landform was redesigned to minimise any additional disturbance, potential visual impacts and ensure a free draining final landform;
- Mine scheduling was organised to achieve maximum flexibility so as equipment could avoid operating in high or exposed areas during noise enhancing weather conditions particularly during some night time periods;
- Haul roads, where appropriate, were relocated over previously disturbed areas to minimise any additional disturbance, in particular the haul road to the west of the mining area;
- The construction of a new standalone infrastructure complex was not included as part of the Project as this would have created additional disturbance areas. Upgrading existing infrastructure facilities was a natural progression that has significantly reduced the disturbance footprint by approximately 80 ha;
- Increasing the area of rehabilitation to reduce exposed ground where practical and minimising the area of surface disturbance in advance of mining;

- The deletion of a tailings dam from the Project by committing to place all coal washery waste back in pit for burial and then rehabilitation;
- Construction of additional sedimentation dams to capture and allow settling prior to water flowing offsite; and
- The implementation of best-practice noise and air quality mitigation measures and technologies where practical.

The Project presented in the EA has continually evolved with a balanced consideration of all potential environmental, social and economic impacts, consistent with Ecologically Sustainable Development (ESD).

In recognition of the substantive impacts on the areas ecological values the Project proposes a wide ranging ecological offsets package.

Detailed mine planning, engineering investigations and conceptual studies have identified that the recovery of the coal resource within the Mine Disturbance Boundary, shown on **Figure 7**, via open cut mining methods on balance provides the best alternative in terms of the objects of EP&A Act, by:

- Enabling the most efficient utilisation of resources to extract the coal;
- Maximising the coal recovery so as to promote the social and economic welfare of the community; and
- Minimising the need for washing all coal thus reducing water use which creates a better environmental outcome.

The Project proposes to upgrade existing infrastructure, staying largely within the existing infrastructure area to minimise land disturbance where possible (**Figure 8**).

5 REGULATORY FRAMEWORK

5.1 INTRODUCTION AND BACKGROUND

Boggabri Coal currently operates under the Planning Approvals outlined in **Section 5.2**. A single contemporary Project Approval is now sought under Part 3A of the EP&A Act to replace the existing Planning Approval DA 36/88 following its expiration on 14 November 2011. It is understood that the granting of any new approval would come into effect when the existing approval expires. Existing approvals for activities outside the scope of the EA, including those relating to exploration activities will continue to apply.

The Project may also require approvals under additional State and Federal Acts or *State Environmental Planning Policies* (SEPP) not exempted under Part 3A of the EP&A Act. These are discussed in detail below as relevant to the Project. A flowchart showing the Planning Approvals and consultation process applied to the Project is shown in **Figure 13**.

5.2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

5.2.1 Approval Authority

Boggabri Coal is seeking Project Approval from the Minister for Planning under Part 3A of the EP&A Act for the Continuation of Boggabri Coal Project.

By virtue of Clause 6 of State Environmental Planning Policy (Major Development) 2005, *"Development that, in the opinion of the Minister, is development of a kind that is described in Schedule 1...is declared to be a project to which Part 3A of the Act applies."* Schedule 1 includes *"Development for the purposes of mining...that is coal mining."*

On 17 December 2009, the Director General notified Boggabri Coal of the EARs applying to the Project Application under Section 75F.

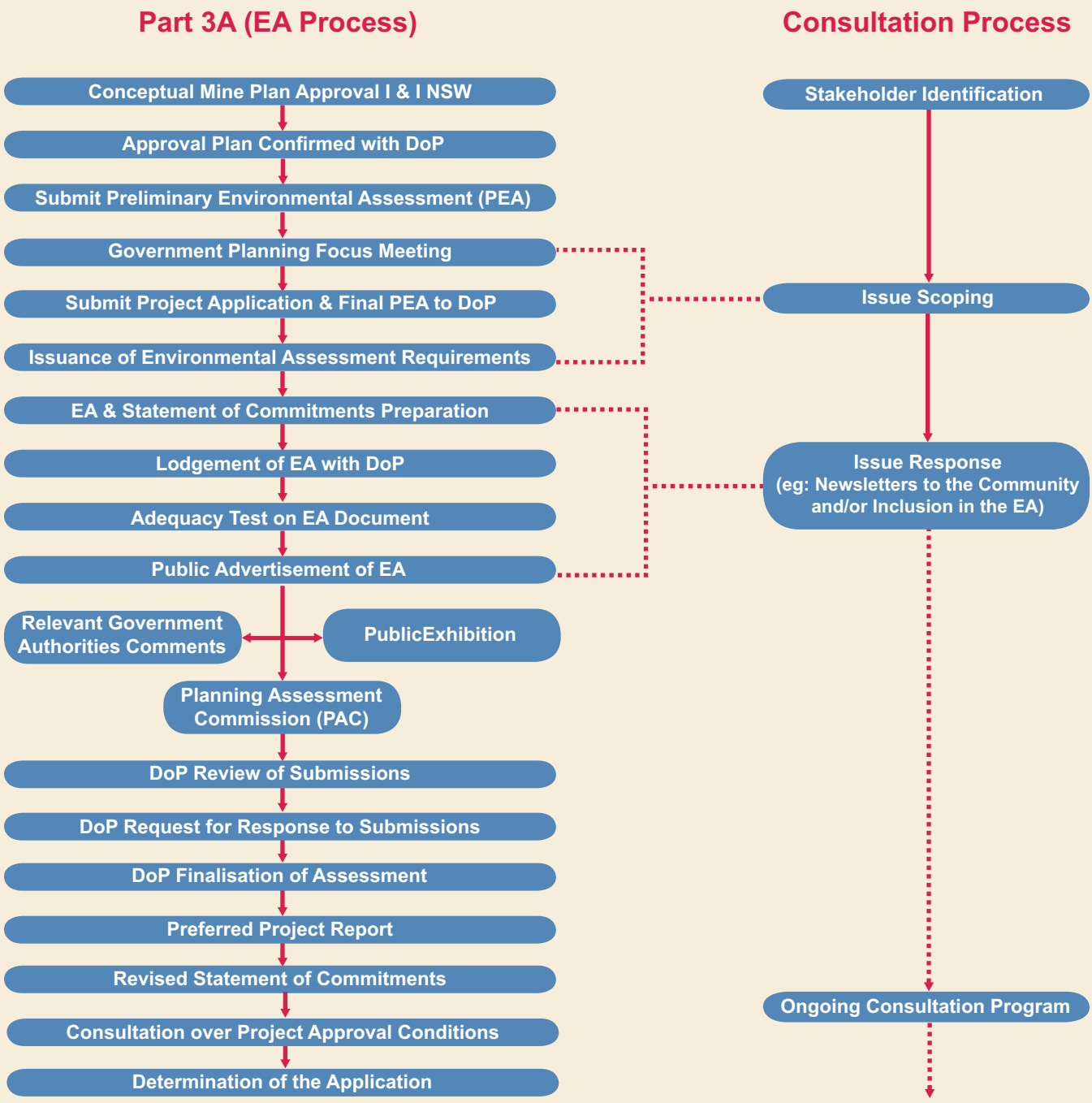
This EA has been prepared in accordance with those EARs as required by Section 75H. The EARs are reproduced in **Appendix D**.

5.2.2 Permissibility of the Project

Under Section 75J(3), the Minister, when deciding whether to approve the carrying out of a project may (but is not required to) take into account the provisions of any environmental planning instrument that would not (because of Section 75R) apply to the project if approved. However, the *Environmental Planning and Assessment Regulation* 2000 (EP&A Regulation) may preclude approval for the carrying out of a class of project that such an instrument would otherwise prohibit. In this respect, Clause 8O of the EP&A Regulation states:

> *"8O Other projects prohibited by environmental planning instruments for which project approval may not be given*
>
> *(1) For the purposes of Section 75J (3) of the Act, approval for the carrying out of a project may not be given under Part 3A of the Act for any project, or part of a project, that:*
>
> *(a) is not the subject of an authorization or requirement under Section 75M of the Act to apply for approval of a concept plan, and*
>
> *(b) is prohibited by an environmental planning instrument that would not (because of Section 75R of the Act) apply to the project if approved."*

Accordingly, it is necessary to consider whether the Project is prohibited by an environmental planning instrument that would not (because of Section 75R) apply to the Project.



* Avenue available to the Minister

Hansen Bailey

BOGGABRI COAL MINE

Planning Approvals & Consultation

Filename: Bogaproval_fig13.indd	Date: 14.03.10	Drawn: MB	Figure 13

5.2.3 State Environmental Planning Policy (Mining Petroleum Production and Extractive Industries) 2007

Clause 5 of SEPP (Mining) provides: "...if this Policy is inconsistent with any other environmental planning instrument, whether made before or after this Policy, this Policy prevails to the extent of any inconsistency".

Clause 7 of (SEPP (Mining)) states:

> *"**7 Development permissible with consent***
>
> *(1) Mining*
>
> *Development for any of the following purposes may be carried out only with development consent:*
>
> *(a) underground mining carried out on any land,*
>
> *(b) mining carried out at surface level:*
>
> *(i) on land where development for the purposes of agriculture or industry may be carried out (with or without development consent), or*
>
> *(ii) on land that is, immediately before the commencement of this clause, the subject of a mining lease under the Mining Act 1992 or a mining license under the Offshore Minerals Act 1999,"*

The Project is permissible under clause 7(1) (b) of SEPP (Mining) if development for the purposes of agriculture or industry may be carried out (with or without development consent) under the terms of the relevant local environmental planning instrument. It is therefore necessary to consider the zonings of the land under the Narrabri LEP No. 5 (Township of Boggabri).

5.2.4 Narrabri Local Environmental Plan No. 5 (Township of Boggabri) (NLEP 5)

Under the Narrabri LEP 5, the Project is located entirely within the Zone 1(a) – Rural A Zone.

5.2.5 Agriculture Zone

Mining is permissible with consent in the Rural A Zone.

In addition, agriculture is permissible and accordingly under clause 7(1) (b) (i) of SEPP (Mining) mining is permissible.

5.2.6 Summary Regarding Permissibility

The Project and associated mining related activities are permissible with consent. Accordingly, the Minister is not precluded from granting approval to the Project by the provisions of Section 75J (3) of the EP&A Act and clause 8O of the Regulation.

5.3 ENVIRONMENTAL PLANNING INSTRUMENTS

In addition to SEPP (Mining), other environmental planning instruments require consideration by the Minister for Planning but for Section 75R of the EP&A Act. Section 75J has the effect of removing the obligation for the Minister to consider any other environmental planning instrument (except SEPPs which *"...expressly provide that they apply to and in respect of the particular project")* (Section 75R (2) (b)) but allows him to do so if he so elects. In this context, the following instruments apply to the consideration of the Project Application.

5.3.1 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

SEPP 33 – Hazardous and Offensive Development (SEPP 33) requires the consent authority to consider the merits of proposed activities including the location of the development and the way in which it is to be carried out. SEPP 33 does not technically apply to the proposed development, as it relates to an industry.

A review of the relevant components of this Project in **Section 4** has confirmed that the Project is not considered to be Potentially Hazardous or Offensive. As such, a detailed preliminary hazardous analysis is not required. Further, as SEPP 33 applies only to proposals that are potentially hazardous or offensive and the proposed development does not constitute a potentially hazardous or offensive industry under Clause 3, SEPP 33 does not apply to this Project.

5.3.2 State Environmental Planning Policy No. 44 – Koala Habitat Protection

SEPP 44 – Koala Habitat Protection (SEPP 44) encourages the conservation and management of koala habitats, to ensure permanent free-living koala populations will be maintained over their present range. The SEPP requires the consent authority to consider whether land the subject of a development application is "potential koala habitat" or "core koala habitat".

The Ecological Impact Assessment carried out for the Project included the consideration of Koala habitat and identified a very low density population of Koalas within and surrounding the Project Boundary and is discussed further in **Section 8.4**.

5.3.3 State Environmental Planning Policy No. 55 – Remediation of Land

SEPP 55 – Remediation of Land (SEPP 55) was enacted to provide a state-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment.

Potentially contaminated sites within the Project Boundary include sheep dips, workshops / machinery sheds used for fuel, chemical and fertiliser storage and landfills.

No contaminated lands have been identified within the Project Boundary that will be disturbed for mining or mining related purposes.

5.3.4 State Environmental Planning Policy (Major Projects) 2005

SEPP (Major Projects) 2005 identifies development to which the assessment and approval process under Part 3A of the EP&A Act applies and establishes the Minister for Planning as the consent authority for development classified as a major project. Coal mining is classified as a major project by the Schedule 1 of SEPP (Major Projects).

5.3.5 State Environmental Planning Policy (Infrastructure) 2007

SEPP (Infrastructure) 2007 aims to provide a consistent planning regime for infrastructure and the provision of services across NSW, along with providing consultation with relevant public authorities during the assessment process.

The provision of public infrastructure for the Project may be required to comply with the following planning regimes designated within the SEPP: electricity transmission or distribution, networks, emergency services facilities and bush fire hazard reduction, railway infrastructure facilities, development in railway corridors, road infrastructure facilities, development in or adjacent to road corridors and road reservations, traffic generating development, sewerage systems, soil conservation works and stormwater management systems. This Policy applies to the State. Certain items of infrastructure associated with the Project may be subject to SEPP Infrastructure.

5.3.6 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (SEPP (Mining)) aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. SEPP (Mining) allows mining at surface level to be undertaken for the Project with development consent.

SEPP (Mining) establishes appropriate planning controls to encourage ESD. It also establishes relevant matters for consideration by a consent authority. The considerations set out by Clauses 12 to 17 are examined and reported upon throughout this EA.

5.4 LEGISLATIVE CONTEXT

In addition to project approval under Part 3A of the EP&A Act, the Project will also require authorisations under various laws. These are discussed below.

5.4.1 Section 75U EP&A Act

Pursuant to Section 75U of the EP&A Act, there are a number of authorisations that will not be required for The Project if approval is granted by the Minister for Planning under Part 3A and the Project becomes an approved project.

Relevantly, the authorisations that will not apply because of Section 75U include:

- A permit under Section 87 or a consent under Section 90 of the *National Parks and Wildlife Act 1974* (NPW Act);
- A permit under the *Fisheries Management Act 1994*;
- An authorisation referred to in Section 12 of the *Native Vegetation Act 2003* to clear native vegetation or State protected land;
- A bush fire safety authority under Section 100B of the *Rural Fires Act 1997*; and
- A water use approval under Section 89, a water management work approval under Section 90 or an activity approval under Section 91 of the *Water Management Act 2000* (WM Act).

5.4.2 Section 75V EP&A Act

Pursuant to Section 75V of the EP&A Act, there are a number of authorisations that must be issued in terms substantially consistent with the Part 3A approval if such approval is required for the conduct of the approved project.

These authorisations include:

- A mining lease under the *Mining Act 1992*;
- An environment protection licence under the *Protection of the Environment Operations Act 1997* (POEO Act) (for any of the purposes referred to in Section 43 of that Act); and
- Consent under Section 138 of the *Roads Act 1993* (Roads Act).

5.4.3 Mining Act 1992

A mining lease will be required to carry out the Project. If the Project is approved by the Minister for Planning then under the EP&A Act the Minister for Mineral Resources must issue a mining lease in terms that are substantially consistent with the Project Approval granted by the Minister for Planning.

Boggabri Coal holds the appropriate mining authorisations for the Project as shown on **Figure 1** and listed in **Table 4**. Boggabri Coal will apply to Industry & Investment NSW (I&I NSW) for a Mining Lease over part of A355 as shown on **Figure 1**. It is proposed that the remaining southern portion of A355 will be relinquished.

Boggabri Coal's Mining Operations Plan (MOP) will be revised to incorporate components of the Project as required.

5.4.4 Protection of the Environment Operations Act 1997

An Environmental Protection Licence (EPL) under the POEO Act will be required for the Project. Boggabri Coal hold EPL No 12407. If the Project is approved then the Minister administering the POEO Act is required to reissue an EPL in terms that are substantially consistent with the Project Approval granted by the Minister for Planning.

5.4.5 Roads Act 1993

The Project proposes the closure of a section of Leard Forest Road and other unformed "paper" roads which will be affected by open cut mining.

Consent under Section 138 of the Roads Act from the NSC (or the appropriate roads authority) will be required for any disturbance to the surface of any road which has not been closed. If the Project is approved then the Council (or appropriate roads authority) is required to issue a consent under Section 138 in terms that are substantially consistent with the Project Approval granted by the Minister for Planning.

5.4.6 Water Act 1912

The *Water Act 1912* (Water Act) will apply to those sections of the mine which are outside of a Water Sharing Plan. The area of mining in the Project is at least partly outside of the Upper and Lower Namoi Groundwater Sources 2003 Water Sharing Plan. Accordingly, a bore licence under Part 5 of the Water Act will be required for the Project as the mine void fits within the definition of "bore" under Part 5 of the Water Act.

The Proponent holds bore licence 90BL253854 and 90BL255090 issued under Part 5 of the Water Act in respect of the property within the Project.

5.4.7 Water Management Act 2000 NSW

Approvals under Sections 89 (Water Use Approvals) Section 90 (Water Management Work Approvals) and Section 91 (Controlled Activity Approvals) would all ordinarily be required for the Project. However, these authorisations will not be required if the Project is approved under Part 3A of the EP&A Act (by virtue of section 75U of this Act).

Approvals under Part 2 of the WM Act (Access Licences) will be required to "*take water*" from a water source located within an area subject to a Water Sharing Plan under the WM Act. Part of the project is within the area of the Upper and Lower Namoi Groundwater Sources 2003 Water Sharing Plan.

An access licence may be acquired or applied for in accordance with Clause 26 of the Water Sharing Plan of the Upper and Lower Namoi Groundwater Sources 2003.

5.4.8 Crown Lands Act 1989

The approval of the Department of Lands will be required under the *Crown Lands Act 1989* for any works in Crown road reserves or on Crown land. Boggabri Coal holds a special lease on two Crown blocks adjacent the Boggabri Coal Terminal.

Approval from the Department of Lands will be sought for the construction of the rail spur and any other mining related activities required to be carried out on Crown lands.

5.4.9 Coal Mine Health and Safety Act 2002

The primary objective of the *Coal Mine Health and Safety Act 2002* (CMHS Act) is to assist in securing the objects of the *Occupational Health and Safety Act 2000* in relation to coal operations and to put in place special provisions necessary for the control of particular risks arising from the mining of coal. Under the CMHS Act Boggabri Coal will be required to seek the approval of the Minister for I&I NSW for the establishment of emplacement areas and the co-disposal of rejects and tailings.

5.4.10 Commonwealth Legislation

An approval from the Minister for Environment (Commonwealth) under Part 3 of the EPBC Act is required for actions which are likely to have a significant impact on a Matter of National Environmental Significance (MNES).

For the purposes of the EPBC Act the Project includes "two components":

- Actions to be undertaken within the existing Boggabri Coal Mine (Boggabri Existing); and
- Actions to be undertaken within the proposed extension to the existing Boggabri Coal Mine (Boggabri Extension).

Boggabri Existing is described in the original Boggabri EIS and was considered under the previous commonwealth environmental legislation including the EPIP Act.

By virtue of the provisions of the Commonwealth ERCP Act, Boggabri Existing is exempt from the requirement for approval under Part 3 of the EPBC Act due to it being previously assessed under the EPIP Act.

This is a view shared by SEWPaC and confirmed in their letter dated 10 December 2009 and included in **Appendix D**.

That part of the Project which is within the area of Boggabri Extension is believed to be likely to have a significant impact on some limited areas of listed Critically Endangered Ecological Communities (CEEC) and species.

Accordingly Boggabri Extension was referred to the Minister for SEWPaC as a proposal under Section 68 of the EPBC Act on 15 December 2009. Boggabri Extension was deemed to be a controlled action by SEWPaC in their letter dated 5 February 2010 (see **Appendix D**).

The "controlling provisions" of the EPBC Act (for the purposes of section 67 EPBC Act) are:

- Sections 18 and 18A (Actions with significant impact on listed threatened species or endangered community); and
- Sections 20 and 20A (Requirement for approval of activities with a significant impact on a listed migratory species).

The proposed action involves the removal of the CEEC listed under Part 13 of the EPBC Act White Box, Yellow Box, Blakely's Gum Grassy Woodland and Derived Native Grassland and of native vegetation which provides potential habitat for listed Threatened species and migratory birds including Regent Honeyeater and Eastern Long Eared Bat.

5.5 MONETARY CONTRIBUTIONS

Under Section 75R(4) of the EP&A Act, Divisions 6 and 6A of Part 4 of the Act apply to Part 3A "projects". The Minister has the power under Section 94 of the EP&A Act to impose a condition on any Planning Approval requiring a payment to a local council (NSC).

The amount is identified as the cost to the local council of providing additional services for the increased demand on existing services due to the Project.

Section 93F of the EP&A Act enables a Voluntary Planning Agreement (VPA) to be established with the proponent (Boggabri Coal) and the local council (NSC).

A VPA excludes the power to impose a condition requiring a contribution under Section 94 of the EP&A Act. In such circumstances, the consent authority or the Minister must be a party to the VPA as required by Section 93F (3A) of the EP&A Act.

A VPA has been successfully negotiated between Boggabri Coal and NSC for the payment of contributions for the Project.

The VPA will be made available as a formal agreement for the Minister, NSC and Boggabri Coal to enter into under Section 93F (3A) of the EP&A Act. The VPA which has been negotiated is intended to make provision for all contributions by Boggabri Coal under Division 6.

5.6 BNC ACT 2005

The *Brigalow and Nandewar Community Conservation Area Agreement* (BNC Agreement) was made pursuant to the *Brigalow and Nandewar Community Conservation Area Act 2005* (BNC Act).

The BNC Act provided for assessment processes and studies and stakeholder consultation within the area known as the Brigalow and Nandewar Community Conservation Area (BNC Conservation Area) within which the Boggabri Project is located.

The objects of the Act are as follows:

"(a) to reserve forested land in the Brigalow and Nandewar area to create a Community Conservation Area that provides for permanent conservation of land, protection of areas of natural and cultural heritage significance to Aboriginal people and sustainable forestry, mining and other appropriate uses, and

(b) to give local communities a strong involvement in the management of that land."

Extensive studies were completed which involved sampling of over 5,000 vegetation plots; systematic surveys of landscapes; classification of vegetation communities throughout the relevant area; analysis of distributions of, and abundance and quality of flora and fauna.

Consultation was undertaken with many stakeholders and the following regional planning measures were implemented in the area to which the BNC Act applies:

"1. 350,000 hectares of native vegetation were set aside for conservation purposes within the Community Conservation Area; and

2. Other lands within the Community Conservation Area (including the lands in which the Boggabri Project is to take place) were set aside or ("zoned") for development including for mining. The area in which the Boggabri Project is to take place was zoned for mining."

The conservation lands were variously dedicated as National Parks, Aboriginal Areas and State Conservation Areas under the NPW Act. These dedications provide for statutory protection of the lands against development and preserve them for ecological and biodiversity offset purposes.

Those dedications were made in direct contemplation and as offsets against the lands which were zoned 4, for the purposes of development (forestry and mining) (including the lands which were zoned for mining in the area of the Boggabri Project).

After consultation processes which involved the Premier's Department, DECCW, I&I NSW and DoP as well as members of the local community and other stakeholders, the BNC Agreement was entered into (between the Minister for Environment, Climate Change and Water and the Minister for Industry and Investment).

The principal purpose of the BNC Agreement is to guide management of the conservation lands (in Zones 1, 2 and 3) and the Zone 4 development lands.

The arrangements described above and the process which led to them provided for and contemplated land uses in the Brigalow and Nandewar region.

The Boggabri Project was ongoing at the time that the BNC Act was passed and when the studies were undertaken and when the conservation lands were dedicated for conservation purposes and when the BNC Agreement was entered into. These processes which involved all the relevant government agencies and provided a comprehensive process resulted in a regional offset of great significance.

6 STAKEHOLDER ENGAGEMENT

This section of the EA provides a summary of the stakeholder engagement program undertaken for the Project, which included comprehensive engagement with local and state government, industry regulators, near neighbours, the local Aboriginal community and the wider local community. It provides an overview of the engagement process applied to the Project, its objectives, a description of the various engagement phases, the engagement activities undertaken and the findings from the program, which have been incorporated into the impact assessments undertaken as part of the EA.

6.1 BACKGROUND

Boggabri Coal is an integral part of the local community in which it operates. Since the commencement of mining in 2006, Boggabri Coal has continued to build strong and effective relationships with its local community and key stakeholders consistent with its policies and values. The consultation undertaken for the Project has quite simply been a continuation of ongoing dialogue with key community and Government stakeholders as part of the mine's logical progression. Ongoing engagement and social impact monitoring activities in conjunction with an established community partnership and contributions program has been successful in enhancing the potential benefits associated with the Project at a local and regional level.

During 2008, the Boggabri CCC was formed with the inaugural meeting held at Boggabri Coal Mine on 27 October 2008. The Boggabri CCC is a constructive committee and has been particularly successful in engaging with the local community.

The engagement process for the EA was undertaken with the aim of identifying stakeholder's issues regarding the Project and ensuring that these issues were appropriately assessed and responded to by Boggabri Coal either directly or within this EA.

A detailed Social Impact Assessment (SIA) and Stakeholder Engagement Program were developed by Hansen Bailey to support the EA.

6.2 STAKEHOLDER IDENTIFICATION

A range of stakeholders were identified for the Project based on existing records held by Boggabri Coal and the confirmation of near neighbour contact details through cadastral analysis and the background research into the Boggabri area in particular. The key stakeholders relevant to the Project and the engagement methods employed for each are listed below in **Table 12**.

6.3 ISSUE SCOPING

Engagement with the community and government stakeholders regarding the Project is outlined below.

6.3.1 Community Engagement

Community engagement was undertaken as part of the SIA for the Project with the following key objectives:

- To identify and document stakeholder / community concerns in relation to the Project;
- To assess the compatibility of the Project with community values and existing land uses;
- To identify the primary and higher order social impacts (direct and indirect) associated with the Project, particularly on those communities within the Narrabri and Gunnedah LGAs;
- To assess potential workforce impacts associated with the Project on services, facilities and infrastructure provision;
- To initiate and maintain open communication / engagement with key stakeholders and the community on all aspects of the Project; and
- To proactively respond to and work with key stakeholders and other interested parties to develop appropriate solutions and strategies to minimise negative impacts and enhance the positive impacts associated with the Project.

Table 12
Project Stakeholders and Engagement Methods

Stakeholder	Engagement Method
Community Stakeholders	
Individual Near Neighbours	• Offer of face to face Briefings (9 individual near residents out of 26 offers) held in September / October 2009 and follow up meeting with residents identified in the zone of acquisition held in July 2010 • Local media coverage • Project newsletters
Local Community (Boggabri, Narrabri and Gunnedah)	• Notice of Application for Project Approval in the *Namoi Valley Independent* and *The Courier* on 20 October 2009 • Local media coverage • NSC Website – Project newsletters
Aboriginal Community	• Request for Expression of Interest Advertisements in the *Namoi Valley Independent* and *The Courier* on 16 July 2009 • Project Briefings held on 19 and 26 October 2009 • Fieldwork conducted between 19 October – 2 November 2009 • Survey Overviews on 23 October and 2 November 2009 • Review of Aboriginal Heritage Report
Boggabri Coal Mine Employees	• Local media coverage • Tool box talks • Project newsletters
Boggabri Coal CCC	• Project Briefing on 25 August 2009 • Project newsletters
Relevant Neighbouring Mines, Industry and Service Providers	• Offer of briefings • Face to face meetings • Project newsletters
Regulatory Stakeholders	
SEWPaC	• Project Briefing on 25 September 2009 • EPBC Referral submission on 15 December 2009 • Offset Strategy Working Group Meeting on 2 February 2010 • Project newsletters
DoP	• Project briefing and presentation on 11 August 2009 • Planning Focus Meeting (PFM) on 9 September 2009 • Project update briefing 24 September 2009 • Offset Strategy Working Group Meeting on 2 February 2010 and 10 March 2010 • Project update briefing meeting 31 March 2010 • Response to Adequacy meeting held on 1 September 2010
NSC and GSC Mayor, Councillors, Officers and Environment Committee	• Project Briefing with Cr Robyn Faber (NSC Mayor) on 25 August 2009 • Project Briefing with Cr Adam Marshall (GSC Mayor) on 25 August 2009 and 22 June 2010 • PFM on 9 September 2009 • Project newsletters • Discussions with NSC over VPA on 11 December 2009, 4 February 2010 and 29 March 2010

Stakeholder	Engagement Method
DECCW	• PFM on 9 September 2009 • BioBanking presentation of findings on 16 November 2009 • Offset Strategy Working Group Meeting on 2 February 2010 and 10 March 2010 • Offset Strategy meeting held on 7 September 2010 • Project newsletters
NOW	• PFM on 9 September 2009 • Project newsletters
I&I NSW (Including Forests NSW)	• Project Briefing and presentation on 10 August 2009 • PFM on 9 September 2009 • Project newsletters • Offset Strategy Working Group Meeting on 2 February 2010 and 10 March 2010
Land & Property Management Authority	• Project Briefing and presentation on 3 June 2010
Namoi CMA	• PFM on 9 September 2009 • Project newsletters
RTA	• PFM on 9 September 2009 • Project newsletters • Draft Traffic Assessment provided for comment on 12 February 2010
ARTC	• Project newsletters
Relevant State & Commonwealth Members of Parliament	• Project newsletters • Briefing Peter Draper MP (Independent), Member for Tamworth on 26 August 2009 • Briefing Tony Windsor MP (Independent), Member for New England on 26 August 2009 • Briefing Mark Coulton MP (Nationals), Member for Parkes on 27 August 2009

Community engagement was undertaken with a range of stakeholders including near neighbours and service providers, as summarised below.

Near Neighbour Engagement

During September and October 2009, 25 near neighbours or landowners in close proximity to the Project were offered the opportunity to participate in a personal project briefing meeting. In total, nine local residents accepted a briefing as part of the SIA program, where participants were able to identify any possible benefits or concerns they may have in relation to the Project. Near Neighbours who are represented on the Boggabri Coal CCC were also engaged through this forum. Engagement with Boggabri Coal Mine's near neighbours has been further complemented by the distribution of community Project newsletters (as shown in **Appendix E**).

The primary objectives of the Project newsletters was to describe the Project and the status of the EA process whilst providing an avenue for the community to voice opinions on the Project, so that they could be considered in the preparation of the EA.

During July 2010 eleven landowners identified as being in the zone of acquisition because of potential noise impacts from the Project were given the opportunity for a further briefing meeting. Eight landowners accepted the meeting to review the findings and outcomes of the EA.

Service Provider Engagement

Service providers across the local region (including accommodation, schools, health providers and childcare facilities) was sourced from existing information to identify their capacity to accommodate the additional construction and operational employees as a result of the Project.

Accessibility to general community services is a key issue across the Narrabri and Gunnedah communities and therefore it was important to understand how a change in workforce demographics from the Project may impact on service provision.

6.3.2 Regulatory Engagement

Extensive engagement was also undertaken to identify issues that government agencies had in relation to the Project with a summary provided in **Table 12**.

A Planning Focus Meeting (PFM) was held at the Mackellar Motor Inn Conference Room in Gunnedah on 9 September 2009, which included a site visit and presentation and discussion of the Project, identified environmental impacts, proposed assessment methodology and preliminary mitigation measures.

The PFM was attended by representatives of DoP, DECCW, NSW Office and Water (NOW), I&I NSW (Mineral Resources, Forests NSW and Fisheries NSW), Namoi Catchment Management Authority, NSW Roads and Traffic Authority (RTA), NSC, Gunnedah Shire Council (GSC), IAR and Boggabri Coal.

6.4 ISSUE RESPONSE

The objective of this stage of stakeholder engagement was to ensure that appropriate responses were provided for all stakeholder issues raised in relation to the Project and that relevant strategies for their management and mitigation were considered in the EA. Where possible, specific issues raised in relation to the Project were addressed with the relevant stakeholders.

6.4.1 Regulatory Feedback

Forests NSW is the responsible land manager of the Leard State Forest. Boggabri Coal has an access and compensation agreement with Forests NSW for its current and proposed mining activities in the Leard State Forest. NSW Forests are supportive of the Project. I&I NSW Mineral Resources were presented the proposed mine plan for the Project on 10 August 2009 and were supportive of this.

In response to the stakeholder engagement undertaken for the Project and the Major Projects Application, DoP issued EARs for the Project on 17 December 2009 which incorporated responses from other regulators. The EARs are provided in full in **Appendix D**, while **Table 13** lists each requirement and where it is addressed in the EA.

6.4.2 EA Feedback

Following the completion of the initial community and regulatory stakeholder engagement processes all issues raised were addressed by either Boggabri Coal or the relevant specialists for inclusion in the impact studies undertaken for the EA. Those stakeholder issues relevant to the current Boggabri Coal Mine were included in the ongoing stakeholder engagement program.

Feedback on the issues raised was provided to stakeholders via personal meetings to affected landowners or near neighbours who noted they were interested in follow-up briefings. Project newsletters were distributed to the local community, which provided community engagement feedback and provided contacts to arrange a follow-up briefing as required.

6.4.3 Near Neighbour and Other Stakeholder Feedback

A range of environmental issues of concern were raised by stakeholders during the engagement process. The potential for loss of Biodiversity, closure of a section of Leard Forest Road and cumulative impacts were commonly raised. Other issues raised included employment and economic impacts, water management, rail and road traffic and community contributions.

Table 14 provides a summary of the issues raised by stakeholders and where each is addressed in the EA. The findings of the stakeholder engagement program were also incorporated into the risk assessment conducted for the Project which is discussed further in **Section 7**.

Table 13
Director-General's Environmental Assessment Requirements

Issue	Description	EA Section
General Requirements	The EA of the Project must include: • an executive summary	**Executive Summary**
	• a detailed description of: o historical mining operations; o existing and approved mining operations / facilities, including any statutory approvals that apply to these operations / facilities; and o the existing environmental management and monitoring regime;	**1.0, 2.0 & 3.0**
	• a detailed description of the Project, including the: o need for the Project; o alternatives considered including justification for the proposed mine plan; o likely staging of the Project; o likely interactions between the project and existing and proposed mining operations; and o plans of any proposed building works;	**4.0**
	• A risk assessment of the potential environmental impacts of the Project, identifying the key issues for further assessment;	**7.0**
	• A detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes: o A description of the existing environment, using sufficient baseline data; o An assessment of the potential impacts of the Project, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions (see below); and o A description of the measures that would be implemented to avoid, minimise, and if necessary offset the potential impacts of the Project, including detailed contingency plans for managing any significant risks to the environment;	**8.0**
	• A statement of commitments, outlining the proposed environmental management and monitoring measures;	**9.0**
	• A conclusion justifying the Project on economic, social and environmental grounds taking into consideration whether the Project is consistent with the objects of Environmental Planning & Assessment Act 1979; and	**10.0**
	• A signed statement from the author of the EA, certifying that the information contained within the document is neither false nor misleading	**i**
Key Issues	• **Biodiversity -** including: o Measures taken to avoid impacts on biodiversity; o Accurate estimates of the proposed vegetation clearing; o A detailed assessment of the potential impacts of the Project on any: ▪ Terrestrial or aquatic Threatened species, populations, ecological communities or their habitats, including; - White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grassland; and - Weeping Myall Woodland;	**8.4 & 8.5**

Issue	Description	EA Section
	▪ Regionally significant remnant vegetation, or vegetation corridors; and ○ an Offset Strategy (in accordance with NSW Commonwealth policies);	
	• **Soil & Water -** including: ○ Detailed modelling of the potential surface and groundwater impacts of the Project; ○ A detailed site water balance, including a description of the measures to be implemented to minimise water use onsite; ○ A detailed assessment of the potential impacts of the Projects on; ▪ The quantity and the quality of both surface and ground water resources; ▪ Water users, both in the vicinity of and downstream of the Project; ▪ The riparian and ecological values of the watercourses both onsite and downstream of the Project; and ▪ Environmental flows; and • A detailed description of the proposed water management system for the project and water monitoring program	**8.8, 8.9, 8.10 & 8.15**
	• **Air quality -** including a quantitative assessment of the potential air quality impacts of the Project	**8.1**
	• **Noise & Blasting -** including a quantitative assessment of the potential: ○ Construction, operational and transport impacts (noise modelling should be based on applicable meteorological and stability category temperature inversion conditions to be developed in consultation with DECCW); and ○ Blasting impacts of the Project on people, livestock and property;	**8.2**
	• **Traffic & Transport -** including: ○ Accurate predictions of the road and rail traffic of the Project; ○ A detailed assessment of the potential impacts of this traffic on the capacity, efficiency, and safety of the road and rail networks; ○ A detailed description of the strategy for the proposed closure of Leard Forest Road; and ○ A detailed assessment of the potential impacts on the road / rail crossings at Gunnedah and Curlewis (with suitable consultation to be undertaken with Whitehaven Coal Limited);	**8.19**
	• **Heritage –** both Aboriginal and Non Aboriginal;	**8.6 & 8.7**
	• **Greenhouse Gas -** including: ○ A quantitative assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the Project and identification of which emissions would be covered by the Commonwealth Government's proposed Carbon Pollution Reduction Scheme; ○ A qualitative assessment of the potential impacts of these emissions on the environment; and ○ An assessment of all reasonable and feasible measures that could be implemented onsite to minimise the greenhouse gas emissions of the Project and ensure that it is energy efficient;	**8.1**

Issue	Description	EA Section
	• **Visual;**	**8.3**
	• **Waste -** including; o Accurate estimates of the quantity and nature of the potential waste streams of the Project, including tailings and coarse reject; and o A detailed description of the measures that would be implemented to minimise the production of waste onsite, and ensure that any waste produced is appropriately handled and disposed of;	**8.14**
	• **Hazards –** including bushfires;	**8.17 & 8.18**
	• **Rehabilitation -** including a detailed description of the proposed rehabilitation strategy for the project area having regard to the key principles in the strategic framework for mine closure (see relevant guidelines below), including: o Rehabilitation objectives, methodology and proposed completion criteria; o Nominated final land use, having regard to any strategic land use planning or resource management plans or policies; and o The potential for integrating this strategy with any other offset strategies in the region;	**8.16**
	• **Social & Economic –** including: o An assessment of the potential impacts of the Project on the local and regional community, paying particular attention to the demand it may generate for the provision of additional infrastructure and services; and o A detailed assessment of the costs and benefits of the Project as a whole, and whether it would result in a net benefit for the NSW community	**8.12 & 8.13**
References	The EA of the key issues listed above must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the EA of this Project	**13.0**
Consultation	During the preparation of the EA, you should consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners In particular you must consult with: • The Commonwealth Department of Environment, Water, Heritage & the Arts; • Department of Environment, Climate Change & Water, including the NSW Office of Water; • Industry and Investment NSW; • Department of Transport & Infrastructure; • NSC; • Gunnedah Shire Council; and • Namoi Catchment Management Authority The consultation process, and the issues raised during the process, must be described in the EA	**6.0**

Table 14
Stakeholder Issues

Ref	Issue Raised	Section Addressed in EA
1	***Air Quality***	**8.1**
a	No issues were raised regarding Air Quality impacts	
2	***Employment & Community***	**8.12 & 8.13**
a	Increased direct and indirect employment in the Narrabri and Gunnedah area for the Project	
b	Economic impacts in the Narrabri & Gunnedah LGAs and provision of services and infrastructure	
3	***Noise & Blasting***	**8.2**
a	No issues were raised regarding noise and Blasting	
4	***Visual Amenity***	**8.3**
a	Visual impacts from the rail spur bridge across the Kamilaroi Highway and Namoi River floodplain	
5	***Property Devaluation***	**8.12**
a	Potential devaluation of properties in close proximity to the Project	
6	***Surface Water***	**8.8**
a	The potential for the Project to impact on local surface water catchment yields	
7	***Groundwater***	**8.10**
a	The potential for impacts on local and regional groundwater reserves	
8	***Traffic***	**8.19**
a	Closure of a section of Leard Forest Road and limited access to properties during times of flooding via Harparary Road	
b	Increased traffic volumes for local road and rail network as a result of the Project	
c	Safety and adequacy of Manilla Road and Leard Forest Road due to additional vehicles accessing the Boggabri Coal Mine for the Project	
9	***Final Land Use & Void Management***	**8.15 & 8.16**
a	Stakeholders were interested in potential land use for the area on completion of the Project	
b	Post-mining rehabilitation options (e.g. returned to natural habitat)	
c	Processes to be followed in the development of final landform and mine closure processes	
10	***Flora & Fauna***	**8.4**
a	Loss of Biodiversity and endangered ecological communities	

6.5 ABORIGINAL COMMUNITY ENGAGEMENT

6.5.1 Introduction

The requirements of the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC, 2005) and *Interim Community Consultation Requirements for Applicants* (DEC, 2004) were applied to ensure that an appropriate level of engagement with the Aboriginal community was undertaken for the Project in relation to Aboriginal Archaeology and Cultural Heritage.

Further detail on the engagement process with Aboriginal community stakeholders along with results from the Archaeological and Cultural Heritage Assessment is provided in **Section 8.6**.

6.5.2 Notification and Registration

The Aboriginal stakeholder consultation program was conducted in accordance with the DECCW guidelines, "*Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation" (DEC 2005)* and "*Interim Community Consultation Requirements for Applicants" (*DEC 2004).

The NSC, NSW Native Title Searches, NSW Department of Aboriginal Affairs – Office of the Registrar, Red Chief Local Aboriginal Land Council (RCLALC) and DECCW were all notified by letter on 14 July 2009 of the Project. Requests were made for information regarding the contact details of known Aboriginal stakeholder groups in the locality for consultation (**Appendix K**).

Notification of the Project was provided in local newspapers in order to identify Aboriginal stakeholders who wanted to be consulted in regard to the Aboriginal Archaeological and Cultural Heritage Assessment. Boggabri Coal placed one identical Public Notice in both the *Namoi Valley Independent* and *The Courier* on the 16 July 2009 seeking registration of interest for participation in the consultation program (**Appendix K**).

Three Aboriginal groups; RCLALC, Gunida Gunyah Aboriginal Corporation (GGAC), Bigundi Biame Traditional People (BBTP) registered their expression of interest in the Project verbally or in writing in response to the newspaper advertisements (**Appendix K**).

DECCW provided a list of the contact details for eight known Aboriginal stakeholder groups who they felt may have had an interest in the Project on 20 July 2009. A letter was received from NSC on 31 July 2009 stating that no records of Aboriginal stakeholder reference groups are held referencing DECCW as the primary source of information.

An expression of interest letter was faxed and posted to each Aboriginal stakeholder group, as identified by DECCW who had not already registered an expression of interest in the Project. The expression of interest letter outlined the details of the Project and invited each stakeholder group to participate in the Archaeological survey or to be consulted in relation to Aboriginal and Cultural Heritage matters.

In response to the personalised expressions of interest letters sent, a further three groups; Cacatua Cultural Consultants (Cacatua CC), Elli Lewis Cultural Heritage Consultants (ELCHC) and Min Min Aboriginal Corporation (MMAC) registered their expression of interest in regard to the Project. Gomeroi Narrabri Aboriginal Corporation (GNAC) chose to decline the invitation to participate in the Archaeological survey as it was out of their area of Cultural Heritage interest.

A full list of all known Aboriginal stakeholder groups that were consulted is presented in **Table 15**.

6.5.3 Engagement Regarding Survey Strategy and Conservation Values

All Aboriginal groups that provided an expression of interest in the Project were sent a hard copy of the proposed methodology for assessment developed by Insite Heritage on the 7 September 2009. Aboriginal stakeholder group representatives were encouraged to provide comments and raise any concerns they may have in relation to the Project regarding Cultural Heritage or the survey methodology.

Table 15
Consulted Aboriginal Stakeholder Groups

Name of Group	Primary Contact	Expression of Interest
Red Chief Local Aboriginal Land Council (RCLALC)	Robert Horne	Yes
Bigundi Biame Traditional People (BBTP)	Wayne Griffiths	Yes
Min Min Aboriginal Corporation (MMAC)	Gwen Griffen	Yes
Gunida Gunyah Aboriginal Corporation (GGAC)	Jane Bender	Yes
Elli Lewis Cultural Heritage Consultants (ELCHC)	Patricia Jean Hands	Yes
Cacatua Cultural Consultants (Cacatua CC)	Donna Sampson	Yes
Gomeroi Narrabri Aboriginal Corporation (GNAC)	Craig Trindall	No

6.5.4 Summary of Responses

Correspondence was received from the six Aboriginal groups regarding the proposed methodology and expressing an interest in participating in the field survey component of the assessment.

All responses, with the exception of one accepted the design of the proposed survey methodology for the Project. RCLALC believed that the anticipated timeframe of the assessment would not be sufficient to accurately assess the study area. RCLALC also raised the need to consider previous work that had been done in the area. RCLALC also noted that a buffer zone along the rail alignment should be included as part of the assessment, and that a representative from RCLALC should be present throughout the duration of the assessment. On 1 October 2009 a letter of response was provided to RCLALC to address the above concerns regarding the proposed methodology.

BBTP and MMAC agreed with the proposed methodology however, were interested to know if any of the artefacts found during the fieldwork would be removed for exhibition in the RCLALC Museum. Cacatua CC, GGAC and ELCHC all agreed with the design of the proposed methodology and were satisfied that all Archaeological and Cultural Heritage values would be considered in the assessment.

As part of the induction process prior to the commencement of the fieldwork a detailed presentation of the Project and the Aboriginal Archaeology and Cultural Heritage Assessment was provided to all representatives. The presentation was conducted by Boggabri Coal and Insite Heritage and included a description of the Project followed by the proposed survey methodology. The presentation was followed by a discussion inviting input from the Aboriginal community.

Any concerns raised by Aboriginal representatives in response to the proposed methodology were discussed, with all stakeholders satisfied that the final methodology would accurately assess the Project Boundary.

Specifically, the methodology was designed to include a 50 m buffer either side of the proposed rail alignment to ensure any future areas required for drains or culverts were included in the assessment. It was also mentioned that the proposed 10 days field work was likely to be an adequate timeframe to complete the survey, given the anticipated level of surface visibility. It was agreed that additional time would be considered following the completion of the 10 day field work if the cover of the study area was considered inadequate.

No additional concerns or comments were raised by any Aboriginal stakeholder group in relation to the Project or methodology. All written responses and acceptances of the survey methodology are provided in **Appendix K**.

6.5.5 Fieldwork

A total of six Aboriginal stakeholder groups registered their acceptance of the methodology and indicated they would like to participate in the fieldwork component of the Aboriginal Archaeology and Cultural Heritage Assessment. On 8 October 2009, a letter was sent to all six groups confirming the field work.

The field survey was originally developed to be conducted over a period of 10 working days. However, due to wet weather on Monday, 26 October 2009 an additional day of fieldwork was required to complete the assessment. The six Aboriginal stakeholder groups were split into two field groups. Group 1 consisted of four Aboriginal stakeholder representatives and Group 2 consisted of three Aboriginal stakeholder groups. Each group was allocated five successive days field work. Prior to their commencement in the archaeological survey all groups were contacted by telephone to confirm designated fieldwork days.

The archaeologists involved were; Angela Besant, Chris Carter and Mike Parker from Insite Heritage. Fieldwork was conducted between 19 October and 2 November 2009. The study area as defined in the methodology was surveyed with a total area of 2,930 ha and a further 470 ha of previously surveyed land sampled.

At the completion of each group's field work allocation, archaeologists from Insite Heritage discussed the findings with the groups and sought any comments or suggestions in relation to Cultural Heritage significance of the areas surveyed. As a result of these debriefs, it was agreed with Aboriginal representatives that the assessment had been undertaken in accordance with the methodology, and that surface visibility had been the main constraint on survey effectiveness. Information regarding the attendance of each Aboriginal stakeholder group and representatives who participated in the archaeological survey is presented in **Table 16**.

6.5.6 Aboriginal Archaeology and Cultural Heritage Report Engagement

A hard copy of the draft Aboriginal Archaeological and Cultural Heritage Report was provided to all six registered groups on 15 January 2010.

As two stakeholders (RCLALC & BBTP) requested an extension of time to consider the report, the response date was extended from the 8 February 2010 to the 22 February 2010. All Aboriginal stakeholders were contacted by telephone prior to the final response dates as noted above.

Reviews of the report were received by the six Aboriginal stakeholders, which were incorporated into the final Archaeological and Cultural Heritage Report described in **Section 6.5**. The reviews of the report can be seen in full in **Appendix K.**

6.6 ONGOING STAKEHOLDER ENGAGEMENT

Boggabri Coal is committed to continuing its stakeholder engagement program throughout the life of the Project. Ongoing stakeholder engagement will include regular contact with neighbouring landowners, representatives of key local and State regulatory authorities, industry bodies and the Aboriginal community and the release of public information on environmental performance. Project information sheets will be distributed upon the submission of the EA to provide an update on the EA process and where the EA may be viewed by the public.

Mechanisms employed at Boggabri Coal Mine to ensure ongoing effective engagement and communication with the Project stakeholders will include:

- Regular engagement with individual near neighbours;
- The Boggabri Coal CCC;
- Company representation on interested environmental and community groups; and
- Issue specific newsletters, as required.

Also, an AEMR that summarises company activities and performance in the areas of health, safety, environment and community is made available to the public in hard copy and is available from Boggabri Coal.

Table 16
Registered Aboriginal Stakeholder Groups that Participated in Archaeological Survey

Field Work	Aboriginal Stakeholder Group	Representative
Group 1 19 – 23 October 2009	Red Chief Local Aboriginal Land Council (RCLALC)	Peter Beale
	Min Min Aboriginal Corporation (MMAC)	Ronald Griffien
	Gunida Gunyah Aboriginal Corporation (GGAC)	Wade Natty and Stan Condran
	Cacatua Cultural Consultants (Cacatua CC)	George Sampson
Group 2 26 – 30 October 2009 & 2 November 2009	Red Chief Local Aboriginal Land Council (RCLALC)	Peter Beale
	Bigundi Biame Traditional People (BBTP)	Gary Griffiths
	Elli Lewis Cultural Heritage Consultants (ELCHC)	Stephen Hands

7 RISK ASSESSMENT

A preliminary risk assessment was undertaken as part of the PEA which accompanied the Major Projects Application to DoP to identify potential environmental issues associated with the Project. The primary purpose of the Risk Assessment process was to prioritise and focus the required environmental assessments for the Project. Each of the environmental issues was addressed to a relevant extent and where appropriate the necessary management and mitigation options were developed.

Following stakeholder engagement and the receipt of the EARs, a revision of the preliminary risk assessment was undertaken to incorporate additional requirements. The revised environmental risk assessment is presented in full in **Appendix F**.

The key risks identified for the Project were analysed in accordance with the IAR Risk Assessment Matrix (which meets Standards Australia requirements) and is based on probability and potential consequences.

Each potential environmental issue was ranked as either being of extreme, high, significant, moderate or low risk to the environment. Risk rankings identified for each aspect of the Project were further evaluated based on the outcomes of the stakeholder engagement program, as required.

Findings from the revised risk assessment indicated several aspects associated with the Project which, in the absence of controls, potentially posed a high or significant environmental risk, whilst many of the aspects were rated as moderate to low risk. No extreme risks were identified (see **Table 17**).

Aspects identified throughout the risk assessment process as high, significant, medium and low have each been assessed as part of the EA. Aspects identified as having a higher environmental impact risk formed the primary focus of the EA and were more intensively assessed.

Aspects which have been identified as having a moderate to low risk were also assessed, however a lesser scope of work was conducted for these secondary issues, based on their lower risk rating.

Table 17
Environmental Risks

Extreme Risk	High Risk	Significant Risk	Moderate Risk	Low Risk
None	Ecology	Air Quality	Final Landform	European Heritage
	Surface Water	Noise and Blasting	Flooding	Spontaneous Combustion
	Traffic and Transport	Groundwater		Waste and Hazardous Materials
		Aboriginal Archaeology and Cultural Heritage		
		Visual		
		Rehabilitation and Bushfires		
		Community Concern		
		Greenhouse Gas		
		Social and Economic		