

Executive Summary

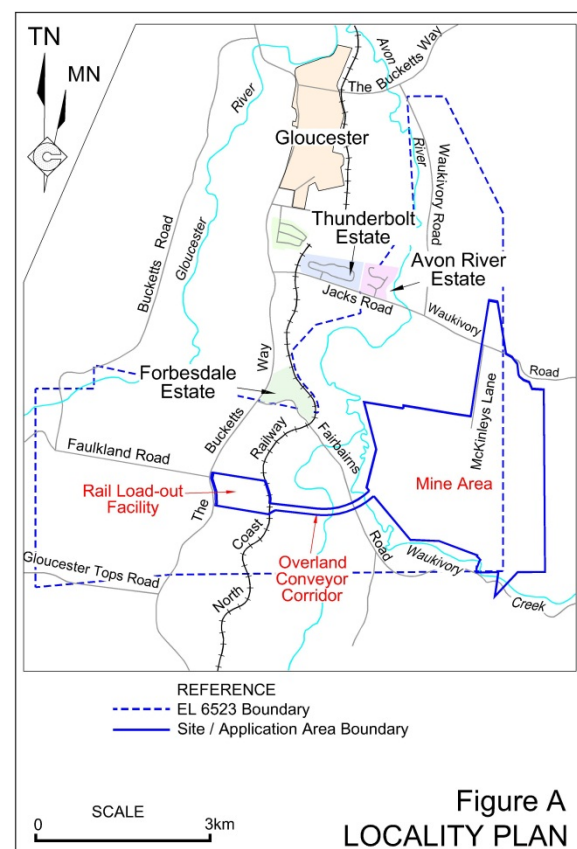
INTRODUCTION

This *Environmental Impact Statement* has been prepared by R.W. Corkery & Co. Pty. Limited to accompany an application for development consent by Gloucester Resources Limited (“the Applicant”) to develop and operate the Rocky Hill Coal Project (the “Proposal”). The Proposal, which has a projected life of between 16 and 21 years, would involve the development of four separate and/or contiguous open cut pits and a coal handling and preparation plant (CHPP) located within the Mine Area, an overland conveyor (within a 50m wide corridor) and a Rail Load-out Facility (see **Figure A**). Approval is being sought to produce up to 2.5 million tonnes of run-of-mine coal per year.

As illustrated in **Figure A**, the application area for the Proposal (the “Site”) is located approximately 3.5km to 7km southeast of the Gloucester urban area. The Site covers an area of approximately 856ha, the majority of which is located on freehold land that the Applicant owns, or has an agreement to lease or purchase. The Site is located to the east of the Waukivory Creek and the Avon River, with the overland conveyor crossing the Waukivory Creek and Avon River floodplains to the Rail Load-out Facility located to the west of the Avon River, between The Bucketts Way and the North Coast Railway.

The Proposal is declared to be State significant development in accordance with the *State Environmental Planning Policy (State and Regional Development) 2011* and consequently, the Minister for Planning and Infrastructure, or the Planning Assessment Commission (under delegation), will be the determining authority.

As State significant development, the Proposal would be assessed under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979*, for which an *Environmental Impact Statement* is required to be submitted.



This Executive Summary introduces the Applicant, provides relevant background information about the Proposal, presents an overview to the Proposal’s design and operational safeguards, as well as a brief description of the local environment and predicted impacts on the surrounding physical, biological and socio-economic environment.

THE APPLICANT

The Applicant for the Rocky Hill Coal Project is Gloucester Resources Limited (GRL), a company formed in 2006 to focus on coal exploration activities within the Gloucester Basin.

GRL is operated by a board and management team with extensive experience in the development, operation and management of open cut and underground coal mining projects. The key personnel are as follows.

- Grant Polwarth – Managing Director and Chief Executive Officer.
- Keith Ross – Former Managing Director.
- Bob Corbett – Environmental Manager.
- Ken Wilson – Technical Services Manager.
- Mark Bobeldyk – Exploration Manager.
- Brad McAndrew – Engineering Manager.

PROPOSAL OBJECTIVES

The Applicant's objectives in developing and operating the Proposal are to:

- maximise coal recovery and the efficiency of mining and processing operations;
- undertake all activities in an environmentally responsible manner to ensure compliance with relevant criteria / goals, reasonable community expectations and documented commitments and, to the extent practicable, the objectives of the *Gloucester Local Environmental Plan 2010*;
- create a final landform that is safe, stable, visually and topographically sympathetic to the existing landform and amenable to the progressive resumption of grazing activities and nature conservation;

- provide a stimulus to the Gloucester and district economies through employment opportunities and the supply of services required for the development and operation of the Proposal; and
- achieve the above objectives in a cost-effective manner to ensure the Rocky Hill Coal Project is viable.

PLANNING CONTEXT

The Site lies within land zoned RU1, E3 and SP2 under the *Gloucester Local Environmental Plan (LEP) 2010*. The LEP identifies mining as a permissible land use in land zoned RU1 but not in E3 or SP2 zoned land, but notes that the limitations on types of development only apply where the type of development proposed is not regulated by a *State Environmental Planning Policy (SEPP)*, specifically citing the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP). The Proposal is a permissible land use in the E3 and SP2 Zones by virtue of the Mining SEPP because:

- mining is a permissible land use with consent within Zone RU1 – Primary Production; and
- the *Gloucester Local Environmental Plan 2010* nominates “extensive agriculture” as permissible in Zone E3: the Mining SEPP provides that mining is permissible where agriculture is a permissible land use, regardless of any restrictions imposed by local environmental planning instruments.

Finally, a 50m section of the North Coast Railway (traversed by the Overland Conveyor Corridor) is zoned SP2 – Infrastructure.

The Proposal would be developed and operated in accordance with a number of State planning instruments and regional strategic planning documents, namely:

- SEPP (State and Regional Development) 2011;
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007;
- SEPP (Infrastructure) 2007;
- SEPP 33 (Hazardous and Offensive Development);
- SEPP 44 (Koala Habitat Protection);
- SEPP 55 (Remediation of Land);
- Strategic Regional Land Use Plan – Upper Hunter (2012); and
- Hunter-Central Rivers Draft Catchment Action Plan 2013-2023.

The EIS addresses each of the above documents together with *Gloucester Local Environmental Plan 2010*.

APPROVALS REQUIRED

In addition to development consent, the Applicant anticipates the following approvals, licences and leases would be required.

- An Environment Protection Licence under the *Protection of the Environment Operations Act 1997*.
- Mining Leases under the *Mining Act 1992* for the area nominated as the application area.
- One or more licences under the *Water Management Act 2000*.
- A water licence under Part 5 of the *Water Act 1912*.
- Approval from the Minister for Resources and Energy under Section 100 of the *Coal Mine Health Safety Act 2002*.
- Approval from the ARTC to construct an overland conveyor over the North Coast Railway.

- A Radiation Licence under the *Radiation Control Act 1990* for measurement devices to be used in the CHPP.
- A series of permits under the *Roads Act 1993* to undertake the proposed road and intersection works and improvements for the Proposal, the overland conveyor crossing beneath Fairbairns Road and closure of the southern section of McKinleys Lane and part of an unformed easterly extension of Faulkland Road. Gloucester Shire Council would be the issuing authority for the required permits.
- Dangerous goods licence – for the storage of explosives under the *Explosives Act 2003*.

BACKGROUND

Coal was first discovered in the Gloucester Basin in 1855, although it was not until the early 1970s when exploration programs were undertaken to provide the basis for the understanding of the geology of the basin.

In 2006, the Applicant was granted three Exploration Licences (ELs) namely EL6523, EL6524 and EL6563, with initial exploration programs undertaken in conjunction with land acquisition processes. The ELs were renewed in 2009 and again in 2013. In the renewal application for EL 6523, the Applicant relinquished a substantial proportion of the former area. **Figure A** shows the current boundary of EL6523.

In early 2010, accelerated exploration programs commenced within EL6523 which identified sufficient coal resources to allow the Applicant to commence planning to develop the Rocky Hill Coal Project.

Based upon the geological modelling, mine design and coal quality information, up to 25Mt of run-of-mine (ROM) coal would potentially be recoverable from the open cut pits within the Mine Area.

PROPOSAL DESCRIPTION

Overview

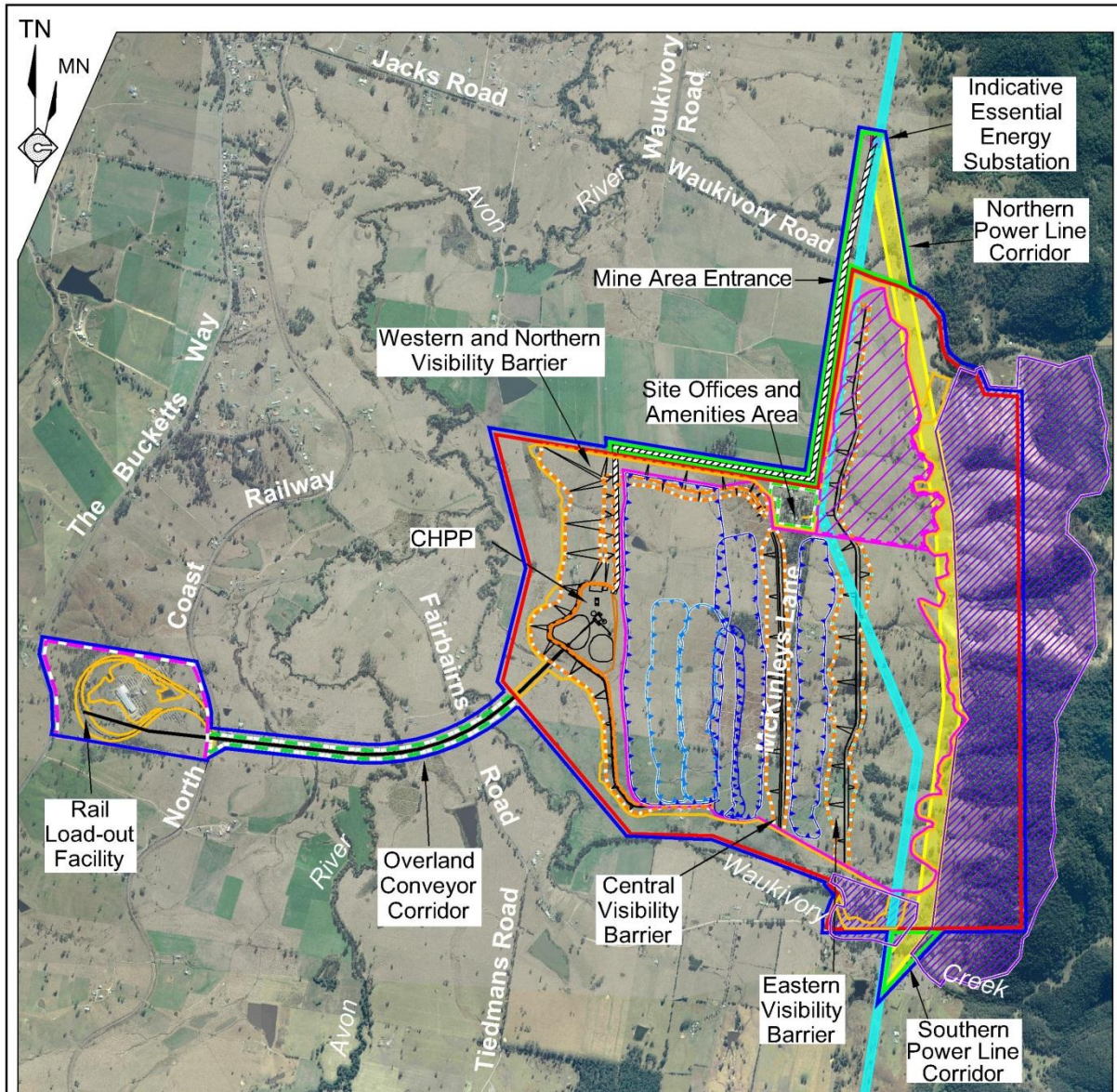
Figure B displays the principal components of the Rocky Hill Coal Project which involves the following.

- The extraction of coal from four open cut pits varying in depth from approximately 70m to 190m, including the development of two smaller, shallower sub-pits.
- Construction and use of three generally north-south trending, short term and long term visibility (and noise) barriers that would be either stand-alone structures or incorporated into the permanent overburden emplacement.
- Construction and use of three overburden emplacements, comprising:
 - a permanent out-of-pit overburden emplacement;
 - an interim overburden emplacement; and
 - an in-pit overburden emplacement.
- Construction and use of a coal handling and preparation plant (CHPP) with associated ROM and product coal stockpile areas, a switchyard, workshop and ancillary buildings.
- Construction and use of an overland conveyor (approximately 3km long) within the Overland Conveyor Corridor which connects the product coal stockpile at the CHPP to the Rail Load-out Facility. The conveyor structure would be positioned above the Waukivory Creek / Avon River 1:500 year flood level.
- Construction and use of a Rail Load-out Facility comprising a “balloon” rail loop, a surge bin accepting coal from the overland conveyor and a feed conveyor connecting the surge bin to a train load-out bin.
- Rail transportation of product coal from the Rail Load-out Facility to the Port of Newcastle for export.
- The relocation of an existing 132kV power line, and the construction of a new low voltage power line providing power for the mine’s operations.
- Construction and use of ancillary infrastructure, including soil stockpiles, internal roads, surface water management structures and offices and amenities.
- Development and progressive rehabilitation of a geotechnically stable, final landform that contains no voids or pits, emulates the existing system of ridges and valleys and is suitable for a final land use of agriculture and/or nature conservation.
- A 267ha Biodiversity Offset Area on company-owned land east of the proposed area of disturbance within the Mine Area.

Site Establishment and Construction Phase

The Applicant would commence the following key site establishment and construction activities following receipt of development consent and all other necessary approvals, licences and leases.

1. Construction of the Mine Area access road commencing near the intersection of McKinleys Lane and Waukivory Road to the site offices and amenities area adjacent to McKinleys Lane.
2. Demolition of the existing buildings within the Mine Area not required for the Proposal and installation / construction of required additional offices and amenities area buildings and light vehicle car parks.



Note: Some boundaries / lines are offset for clarity

- REFERENCE**
- Site Boundary
 - Mine Area Boundary
 - - - - Overland Conveyor Corridor Boundary
 - - - - Rail Load-out Facility Boundary
 - Power Line Corridor Boundary
 - - - - Proposed Open Cut Pit / Sub-pit Boundary
 - - - - Proposed Permanent Overburden Emplacement
 - - - - Proposed Interim Overburden Emplacement
 - Proposed Area of Disturbance within Mine Area / Rail Load-out Area
 - // Biodiversity Offset Area
 - - - - Visibility Barrier
 - Existing 132kV Power Line Easement
 - Indicative 132kV Power Line Diversion Corridor
 - // Proposed 11kV Power Line Corridor

SCALE 1:40 000

0.5 0 0.5 1.0 1.5 2.0 km

Base Photograph Source: Geo-spectrum (Australia) Pty Ltd - Date: 29 June 2010

Figure B
PROPOSED SITE LAYOUT

3. Construction of key site water management structures including clean water diversion channels upslope of the disturbance areas.
4. Construction of the western and northern visibility barrier using materials excavated from the initial mining areas and a pre-strip area within the boundary of the Main Pit, and the commencement of construction of the central visibility barrier using materials excavated from the Weismantel Pit.
5. Construction of the CHPP building, workshop and associated infrastructure, and installation of all processing equipment.
6. Construction/erection of the overland conveyor including the crossing beneath Fairbairns Road.
7. Earthworks (cut and fill) required for the rail loop and any required site remediation.
8. Construction of the rail loop and erection of the train loading infrastructure adjacent to and above the rail loop.
9. Installation of power supply, control infrastructure and other reticulated services.

Where possible, structural elements would be fabricated or assembled off site to reduce the duration of on-site construction activities.

All available soil material would be recovered from areas to be disturbed and stockpiled in designated stockpile areas for use in subsequent rehabilitation activities.

Off-Site Construction Activities

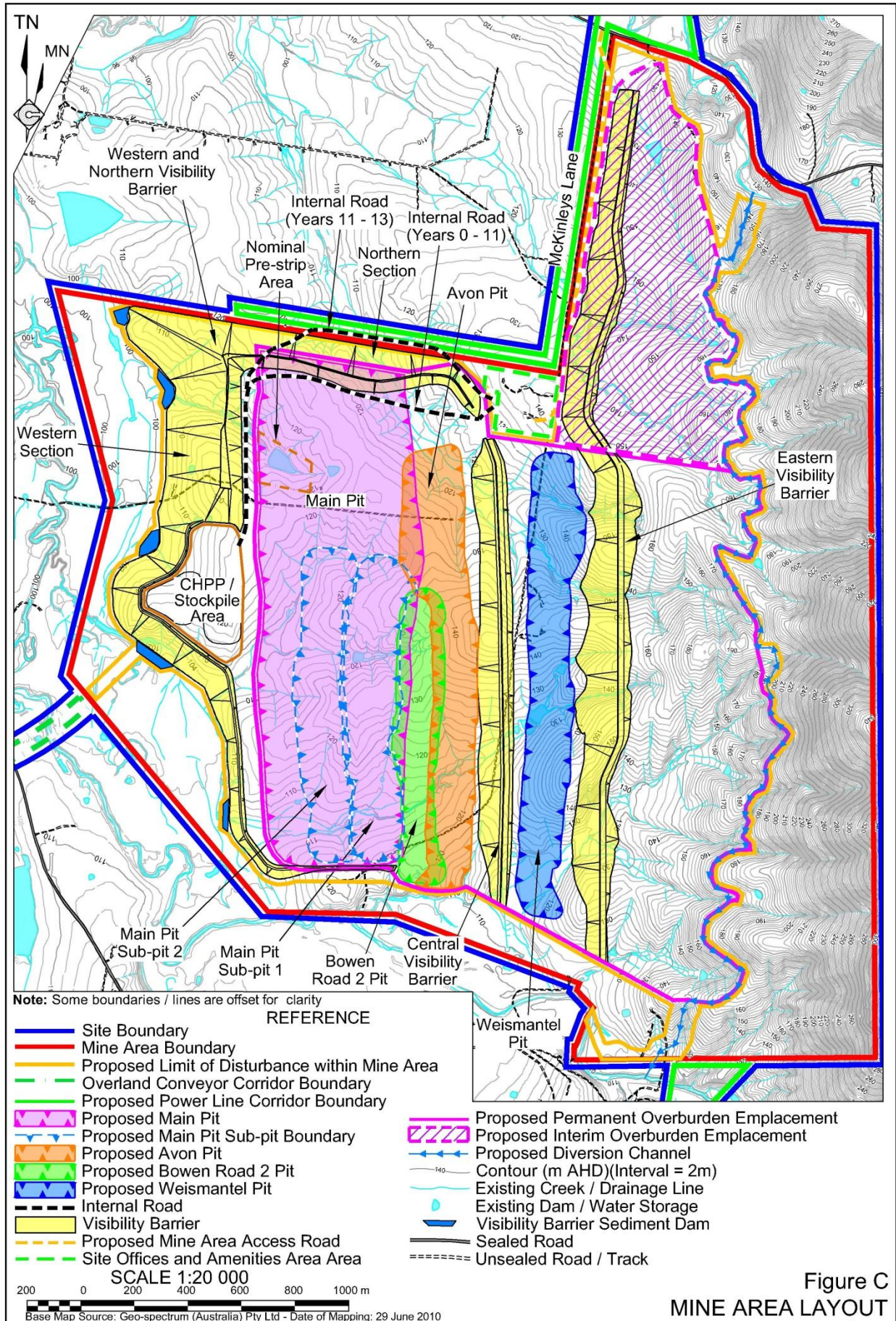
The principal off-site construction activities would include the following.

- The construction of an upgraded intersection with deceleration lanes at the corner of Jacks Road and The Bucketts Way.
- Upgrading and widening the pavement along the full length of Jacks Road.
- Construction of a new bridge across the Avon River on Jacks Road to replace the existing structure closed by Council; upgrading the 1.3km section of Waukivory Road from Jacks Road to McKinleys Lane, and the construction of a suitable intersection with McKinleys Lane.
- The construction of an upgraded intersection at the corner of Jacks Road and Waukivory Road.
- Upgrading a 50m section of McKinleys Lane and constructing the entrance to the Mine Area access road.

Mining Operations

Figure C provides an indicative layout within the Mine Area. Sequential mining operations would be undertaken as follows.

1. Mark out – The locations of each major component of the Proposal would be marked out prior to any activities being undertaken in that component area.
2. Vegetation Clearing – During the life of the Proposal, effective clearing of approximately 41ha of native vegetation would be undertaken progressively following the selective felling and removal of any trees suitable for use for agricultural purposes. Smaller vegetation such as pasture and shrubs would be retained and collected with the soil during the subsequent soil stripping operations.



The remaining larger vegetation would be cleared in a manner so as to minimise soil disturbance and placed within the Biodiversity Offset Areas, stockpiled for subsequent placement on selected areas of the reprofiled landform, particularly those designated as flora and fauna corridors, or mulched for incorporation into the topsoil.

3. Soil Removal and Stockpiling – Topsoil and subsoil would be stripped and stockpiled in nominated areas until the sequence of mining allows the direct transfer of topsoil and subsoil onto the final landform.

Topsoil would be recovered across all areas of planned disturbance to the recommended depth and, where necessary, stockpiled to a height generally no greater than 2m so as to retain the biological viability until it is used in the rehabilitation activities.

Subsoil removal and stockpiling would be undertaken primarily within the areas of the open cut pits and permanent and interim overburden emplacements. Subsoil would be stripped generally to a depth between 650mm and 850mm and, where necessary, stockpiled to a height generally not greater than about 4m.

Overburden/Interburden Management – The initial overburden/interburden (referred to collectively as “overburden”) from the pre-strip area within the Main Pit, Bowen Road 2 Pit and Weismantel Pit would be used to construct the western and northern visibility barrier, with the remaining overburden, being used to construct the central visibility barrier. During the

subsequent years, construction of a further barrier (eastern visibility barrier) would be undertaken.

The overburden that is not required for the construction or extension of the visibility barriers would be transported to the permanent or interim overburden emplacements and placed in a manner that creates a landform that emulates the existing series of ridges and valleys. The interim overburden emplacement would ultimately be removed following the completion of all coal extraction and, together with the material from the western and northern visibility barrier, used to backfill the final void in the Main Pit.

4. Coal Recovery – The coal exposed in each open cut pit would be removed by excavator and transported by haul truck to the ROM coal stockpile.
5. Rehabilitation – Areas of disturbance would be progressively rehabilitated (either temporarily or permanently) to minimise any potential visual impact, control erosion and the potential for dust generation and expedite the return of nominated areas of the final landform to a grazing land use.

Processing Operations

All ROM coal would be processed within the CHPP which would incorporate equipment for coal handling, pre-treatment, coarse and fine coal cleaning, washed coal handling and coarse and fine reject management.

Washed and processed coal would be stockpiled adjacent to the CHPP prior to being transported by the overland conveyor to the Rail Load-out Facility for despatch via rail.

Transportation and Traffic

Rail Transportation

All product coal would be transported via the overland conveyor within the Overland Conveyor Corridor to the Rail Load-out Facility for train loading and despatch to the Port of Newcastle. Trains would generally be loaded within a period of approximately 90 minutes. It is anticipated that at full production, an average of less than two trains per day would arrive and leave the Rail Load-out Facility, with the times for arrival and despatch of trains governed by ARTC rail scheduling. No product coal would be transported by public road.

Road Traffic

Road traffic would comprise employee / visitor vehicle movements and delivery of consumables and equipment.

During both the site establishment and construction and operational phases, road traffic movements to and from the Mine Area would principally occur via The Bucketts Way and Jacks Road and/or Waukivory Road, and the Rail Load-out Facility via The Bucketts Way. Limited traffic would also be generated on Fairbairns Road during construction of the overland conveyor in areas between Waukivory Creek and the Avon River.

During operations, the majority of traffic would occur to and from the Mine Area, with approximately 186 to 294 light vehicle movements and 4 to 16 heavy vehicle movements occurring per day. A small number of vehicles would also access the Rail Load-out Facility via The Bucketts Way and the overland conveyor via Fairbairns Road.

Peak operational traffic movements would occur at the start of each day's operations, i.e. between 6:00am and 7:00am and around shift changes occurring between approximately 2:00pm and 6:30pm, and at approximately 10:00pm and 4:00am.

Hours of Operation

Pre-start activities would be undertaken between 6:00am to 7:00am. Initially, the mining operations would be undertaken between 7:00am and 10:00pm Monday to Saturday, excluding Public holidays, with limited activities subsequently extending to 4:00am following the verification by noise modelling and monitoring that they can be undertaken in a manner which satisfies both operational and sleep disturbance criteria. The nature and scale of mining activity during the period between 10:00pm and 4:00am would be reduced substantially from those undertaken during the daytime (7:00am to 6:00pm) and evening (6:00pm to 10:00pm) periods.

The hours of the CHPP operations would be determined by the rate of ROM coal production from the open cut pits, commencing with daylight operations in the initial years and increasing to a two-shift operation between 7:00am to 10:00pm Monday to Saturday as ROM coal production increases towards the planned maximum level.

Rehabilitation and Final Landform

Throughout the life of the Proposal, the Applicant would undertake both short term (temporary) and long term rehabilitation of disturbed areas. Short term rehabilitation works would be undertaken to stabilise all earthworks, visibility barriers, drainage lines and disturbed areas as well as continually minimising dust generation and the potential for erosion/sedimentation. Depending on the location and timing, the rehabilitation would involve the establishment of a grass cover, grass and shrubs or a mixture of grasses, shrubs and small trees.

Once the final landform has been developed in any area, long term rehabilitation activities would be undertaken. **Figure D** displays the indicative Mine Area final landform.

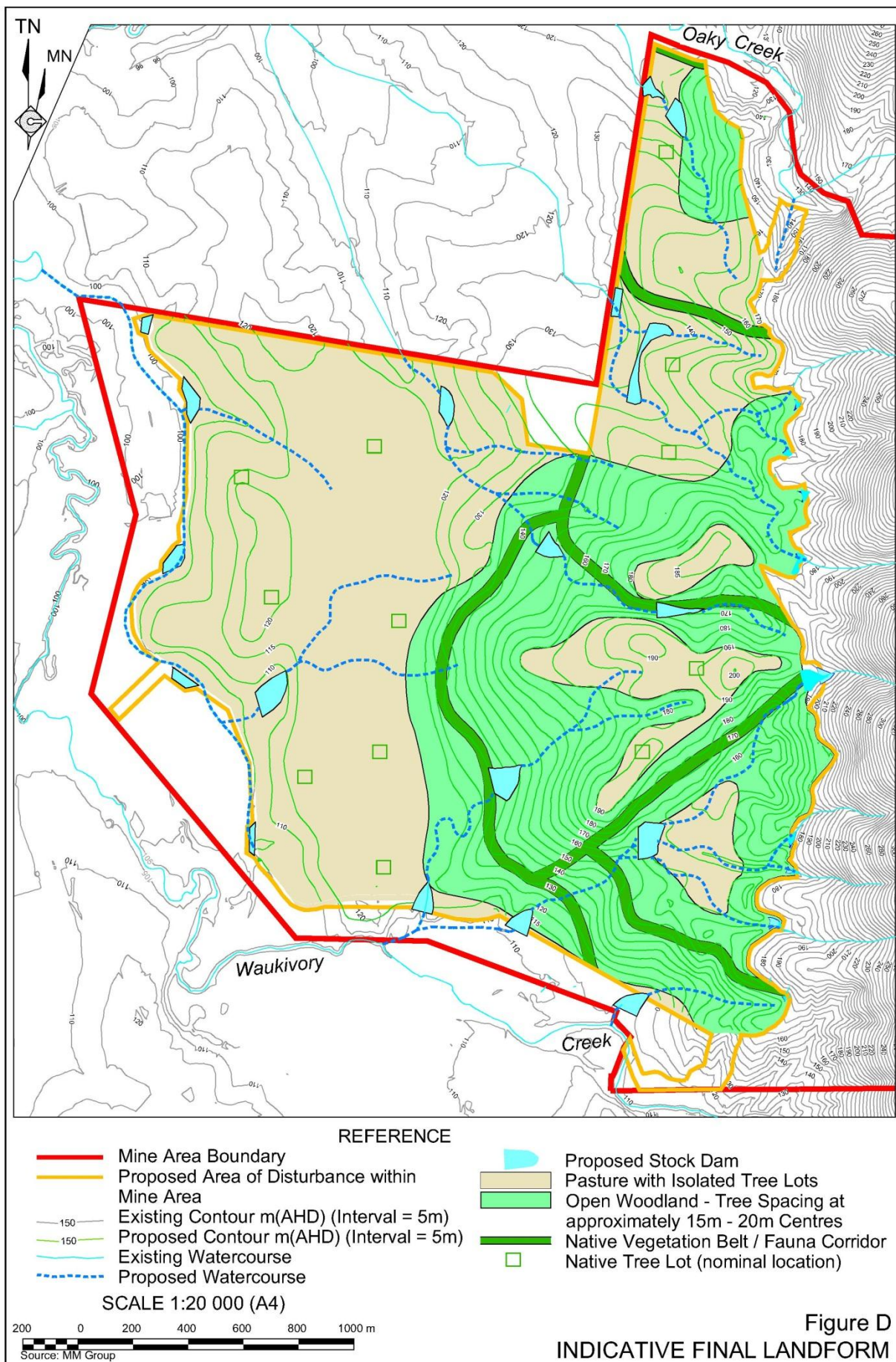


Figure D
INDICATIVE FINAL LANDFORM

Both the short term and long term rehabilitation would be undertaken progressively.

Unlike most mine developments, the proposed final landform is similar in form and drainage patterns to that prior to the development and does not include a final void or open pit.

Longer term rehabilitation objectives are as follows.

- The rehabilitated landform is safe, stable and sustainable with the majority of the land suitable for long term grazing, and with sections of improved habitat value.
- A small proportion of the final landform is re-instated with native vegetation (and excluded from grazing) to specifically provide fauna habitat and corridors.
- The rehabilitation is undertaken in an economically sustainable manner.
- The rehabilitated landform requires levels of maintenance commensurate with that of the surrounding lands.
- The mining leases over the rehabilitated landform can be relinquished and the security returned within a reasonable time after the end of the operational mine life.

CONSULTATION AND ISSUE IDENTIFICATION

A range of issues were identified through a program of community and government consultation undertaken by the Applicant and its consultants.

Consultation with the local community by the Applicant involved the creation of a website, distribution of two newsletters, information dissemination through the Gloucester Exploration Project Community Consultative Committee, telephone calls and meetings between GRL management and any stakeholder who made contact and requested a face to face meeting with the Applicant's representatives.

As part of the wider Socio-Economic Impact Assessment (SEIA) undertaken by Key Insights, a program of research was undertaken which included a Community Perception Survey to gauge the issues and concerns that the community had regarding the Proposal, and extensive consultation with individuals, business owners and operators, service providers, Council and community groups including Forbesdale residents, Gloucester Residents in Partnership (GRIP) and youth focus groups. The following issues were identified in order of frequency as a result of the perception survey results.

1. Impacts on the water supply in the local area.
2. Dust impacts.
3. Visual impacts of the proposed open cut mine.
4. Impacts on agriculture.
5. Impacts on the local character of the area.
6. Noise impacts.
7. Flora and fauna impacts.
8. Increased traffic associated with workers and deliveries to the Site.
9. Coal mining's impact on climate change.
10. More trains moving on local railway lines.

Issue Identification

The following environmental issues were identified to be of most concern to the community members and representatives consulted, principally through the Community Consultative Committee (CCC); meetings involving the wider community, and discussions with individuals and community groups, and Gloucester Shire Councillors and staff.

1. Air quality impacts
2. Groundwater and surface water impacts

3. Ecological impacts
4. Health issues
5. Noise impacts
6. Local traffic impacts
7. Potential employment
8. Visibility and visual amenity impacts
9. Incompatibility with E3 zoning and the Gloucester LEP 2010
10. Impacts on tourism

Consultation with government agencies has been ongoing with liaison involving correspondence and discussions. Some government agencies participated in hosted site visits and a Planning Focus Meeting for the Proposal.

Individual meetings have been held with the Mayor(s) and General Manager(s) of Gloucester Shire Council.

The environmental and social issues raised throughout the consultation process with the local community and Government agencies have been considered by the Applicant throughout the design of the Proposal. Emphasis has also been placed upon achieving a design which, when assessed, satisfies relevant criteria and guidelines as much as possible.

ENVIRONMENTAL FEATURES SAFEGUARDS AND IMPACTS

The components and features of the existing environment within and surrounding the Site have been studied in detail, and the Proposal designed to avoid or minimise potential impacts. **Figure E** places the Site in its local setting, i.e. within the eastern side of the Stroud-Gloucester Valley southeast of Gloucester township. The Mine Area is set back from Waukivory Creek and the Avon River and rises to the east to the lower slopes of the Mograni Range.

The Site is located within a rural area primarily used for beef and dairy cattle operations. The area also contains three large acreage rural-residential subdivisions and a network of regional and local roads. An existing coal mine (Stratford Coal Mine) is located 4km south of the Mine Area.

Figure F displays the surrounding land ownership and receptor locations.

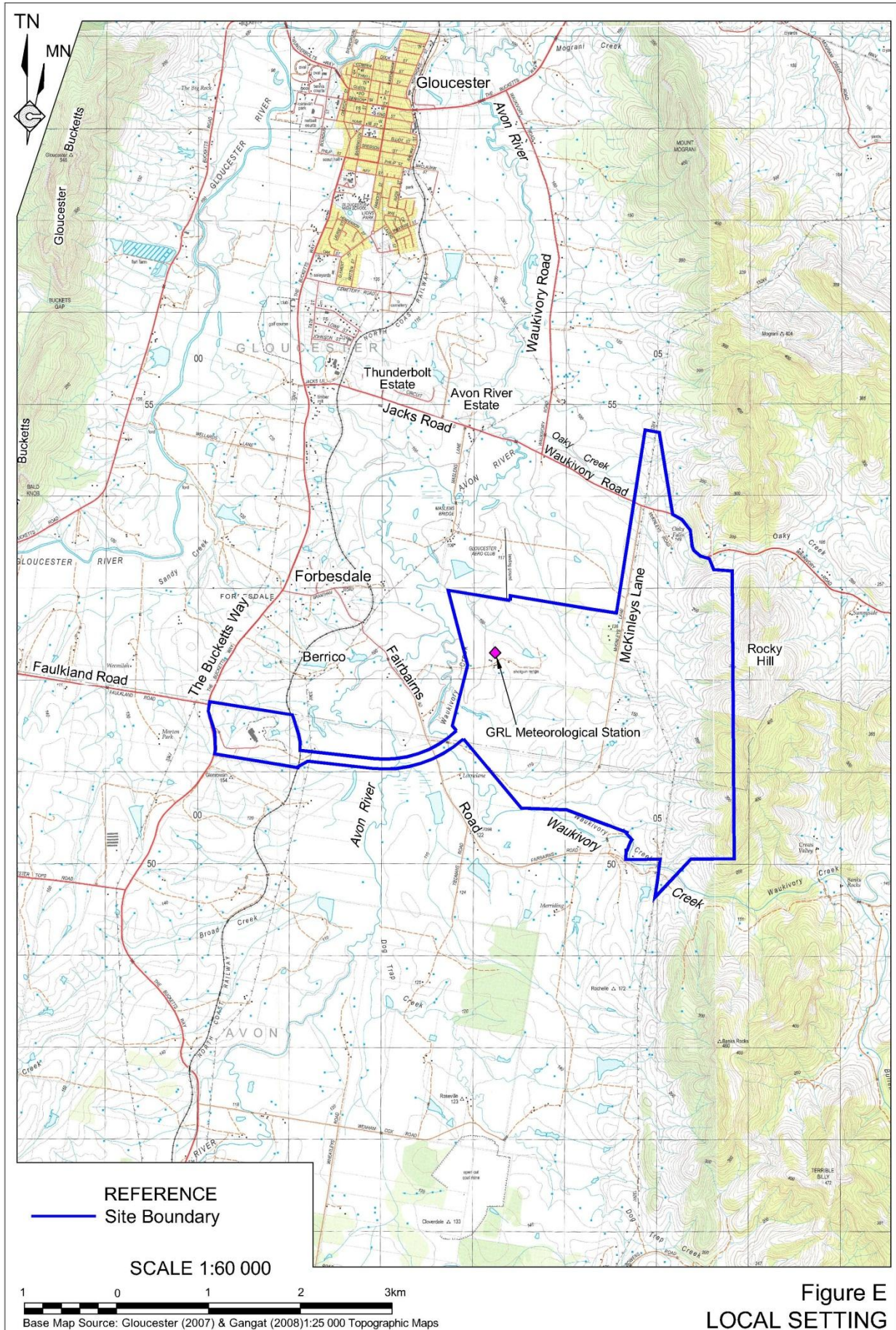
The following provides a brief overview of the main components of the existing environment, the proposed safeguards to be implemented to minimise adverse effects and the assessed level of impact(s) arising from the Proposal.

Noise

Background noise measurements have established that the existing daytime noise levels are comparatively low in areas away from The Bucketts Way and Gloucester township. Noise levels in all areas, including Gloucester, are low of an evening and night. Management of operational noise impacts from the Proposal would include:

- the use of barriers which provide visual and acoustic benefits;
- restrictions on equipment and operations under adverse meteorological conditions;
- use of sound suppressed equipment;
- use of predictive meteorological forecasts;
- a regime of real-time noise monitoring; and
- active site management.

The conservative noise assessment has established that, with the adoption of these measures, it is possible to achieve the stringent criteria that are required for this Proposal, on a 10% exceedance basis, at most privately-owned receptors surrounding the Site.



Noise exceedances are predicted to occur at 12 receptors at some stage(s) throughout the life of the Proposal, i.e.:

- five receptors would experience operational noise levels between 1dB(A) and 2dB(A) above the Project-specific noise criterion;
- three receptors would experience operational noise levels between 3dB(A) and 5dB(A) above the Project-specific criterion; and
- four receptors would experience operational noise levels in excess of 5dB(A) above the Project-specific criterion.

Notwithstanding the predicted non-compliances with noise criteria, it is assessed that the overall impact on the surrounding community would be minimal. The adoption of both pro-active and reactive measures would also provide a mechanism for the assessment and introduction of additional measures in consultation with affected landowners.

Predicted road traffic noise levels at the closest residences adjacent to Jacks Road and Waukivory Road would satisfy the relevant noise criterion during both the site establishment and construction and operational phases.

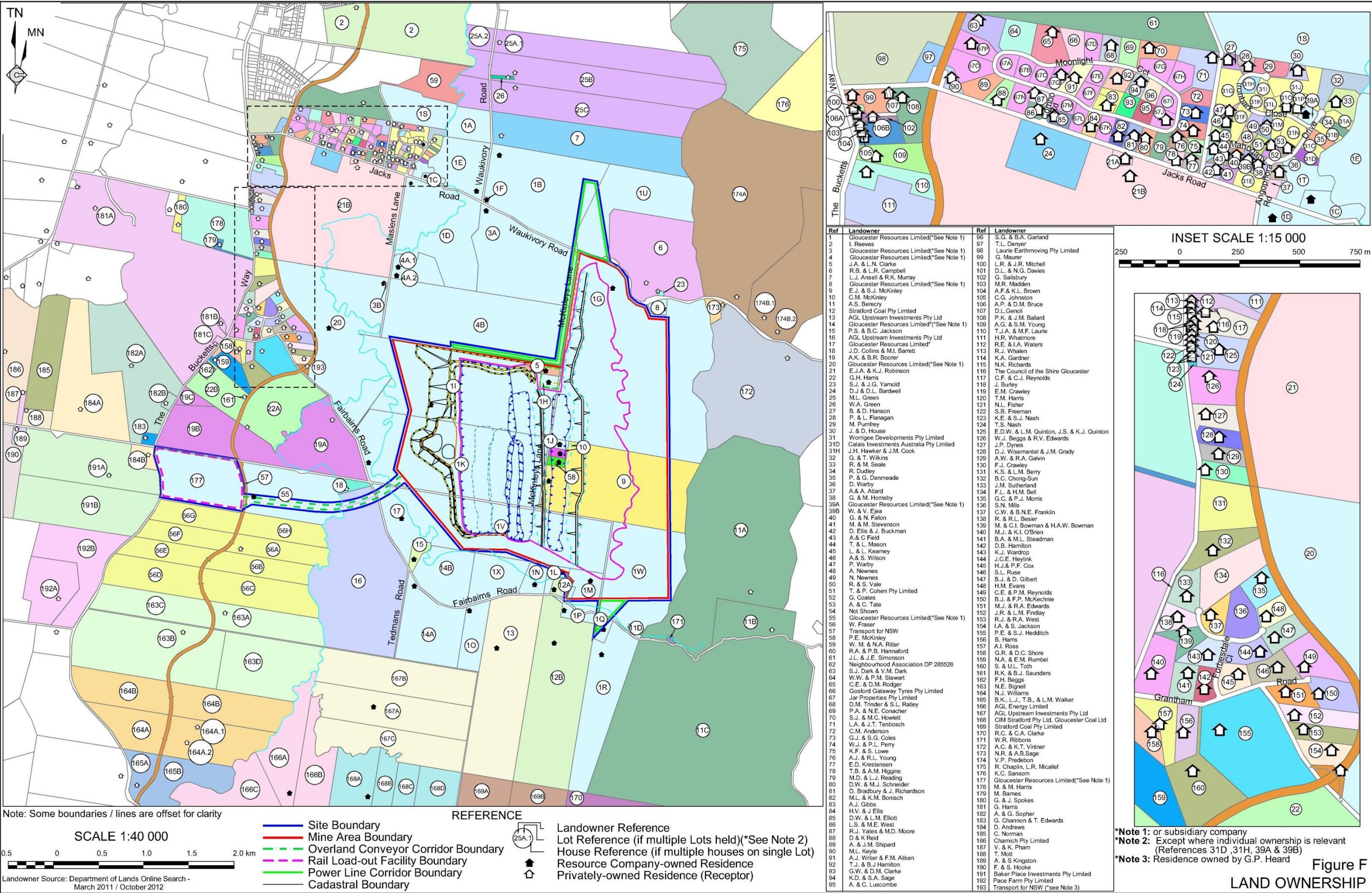
The increase in rail traffic attributable to the Proposal would increase noise levels at the closest residences to the North Coast Railway by between 0.3dB(A) to 1.1dB(A) between the Rail Load-out Facility and Duralie. These levels are considered to be negligible, however, the overall noise levels attributable to existing and proposed movements exceed the $L_{Aeq\ 24hour}$ criterion of 60dB(A) nominated for the ARTC's environment protection licence. The additional noise arising as a consequence of the Proposal would cause exceedances of the 60dB(A) criterion at four additional residences between the Stratford and Duralie Coal Mines.

Other impacts, including those from construction and cumulative impacts with other mines are predicted to be within criteria and are therefore considered acceptable.

Blasting and Vibration

In order to ensure the impacts from blasting associated with the Proposal are minimised, blast design would routinely include the following features to minimise potential impacts from airblast and ground vibration, flyrock and fume emissions.

- Each blast would be conservatively designed to ensure compliance with the relevant blasting criteria at the nearest privately-owned receptor and the potential for fume emissions is minimised.
- Blast design and implementation would adhere to Australian Standard practices.
- Preferentially designing blasts such that the free face is oriented towards the south, i.e. away from nearby privately-owned receptors in the Forbesdale, Thunderbolt and Avon River Estates and the township of Gloucester.
- Monitoring of all blasts to enable continuous refinement of blasting practices and the development and updating of site laws based on those blast monitoring results.
- A blast exclusion zone would be routinely implemented during blasts within the Mine Area.
- Maintaining a hotline advising nearby residents of blasting schedules.
- Undertaking structural surveys of residences within a 2km radius of the open cut pits and any blast sites within the Rail Load-out Facility, where requested.



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Monitoring of the impacts associated with blasting and vibration would be undertaken in accordance with a Blast Monitoring Plan.

Based upon the blasting and vibration assessment, the following were concluded.

- The ground vibration criterion would not be exceeded at any privately-owned receptor for the range of likely blast sizes.
- Blasts would be designed to ensure both ground vibration and airblast over-pressure levels are satisfied at all privately-owned receptors.
- The proposed blast exclusion zone, together with the preferential southward orientation of the blast face, would minimise the potential for fly rock impacts. There would be no requirement for public road closures during blasts within the Mine Area.
- The adoption of the proposed blasting safeguards would ensure dust generated as a result of blasting is minimised.
- There would be no effect on livestock eating patterns, feed intake, production or behavioural activity as a result of blasting operations.
- The movement of delivery trucks on public roads would not be expected to generate vibration levels with the potential to cause damage to buildings.

Air Quality

The results from the Applicant's comprehensive air quality monitoring network which records deposited dust, PM₁₀ and PM_{2.5}, confirms the Site is situated within an area with generally low levels of dust.

Dust generating activities associated with the Proposal have been identified and quantified through dispersion modelling.

The modelling results indicate that the potential impact on air quality at surrounding privately-owned receptors would be minor and would not exceed the recommended annual air quality goals for deposited dust, PM₁₀ and PM_{2.5}.

The predicted Proposal-only ground level concentrations for PM₁₀ and PM_{2.5} at sensitive locations within Gloucester township (including Gloucester High School, Gloucester Hospital and Captain Cook Park) are also well below the relevant health-based impact assessment criteria.

Occasional exceedances of 24 hour air quality goals have been predicted for two receptors not owned or currently under option to purchase by the Applicant.

A comprehensive health risk assessment, based upon the predicted air quality levels, concluded that the air emissions from the Proposal present little likelihood of causing adverse health effects to the local community surrounding the Site and within Gloucester township.

Average annual Scope 1 greenhouse gas emissions, namely emissions attributable to on-site sources, would represent approximately 0.02% of Australia's commitment under the Kyoto Protocol and a very small portion of global greenhouse emissions, given that Australia contributed approximately 1.5% of the global GHG emissions in 2005.

Visibility

Consideration of visual issues has been central to the design of the Proposal, with emphasis placed on both short-term and long-term outcomes. The key visual controls include three generally north-south visibility barriers designed to shield operational activities for the bulk of the life of the Proposal. A range of physical lighting controls, together with restricted operations during the night-time period, would also limit night-time visual impacts.

The visibility barriers will also double as effective acoustic shields to the surrounding sensitive receptors as well as an effective lighting shield for operations undertaken after dusk.

Particularly when viewed from Forbesdale Estate during the construction of the western and northern visibility barrier, the Proposal would have significant short-term impacts on the existing character of the Site. However, as that barrier and the central and eastern visibility barriers are progressively constructed and vegetated, the mining operations would generally not be visible. Some sections of the overland conveyor and some components of the Rail Load-out Facility would be visible from some viewing locations, however their colour and profile, together with the nature of the background, would limit their visibility.

Given the permanent nature of the long term landform, the design of the Proposal from a visual perspective and the visibility assessment placed greater importance on that aspect than short-term changes, culminating in a final landform design which would be indistinguishable from the surrounding landscape.

In order to assist in reducing visibility and potential visual impacts, the Applicant has undertaken a significant strategic vegetation planting program over recent years, concentrating on areas of its properties adjacent to public roads which had been cleared by prior landowners. This program, which will also assist in the re-instatement of corridors for fauna movement, is continuing.

Surface Water and Flooding

The Site is located within the Avon River catchment which incorporates the smaller Waukivory Creek and Oaky Creek catchments. The Avon River is itself, a tributary of the Gloucester River feeds into

the Manning River system before entering the Pacific Ocean near Taree. Water supplies for a number of towns within the region are supplied from the Manning River, approximately 50km downstream of Gloucester, via MidCoast Water's Manning Scheme.

The results of surface water monitoring at 15 sites within and surrounding the Site under a range of flow conditions (on up to 32 occasions) have shown the water in Waukivory and Oaky Creeks and the Avon River generally has a neutral pH, low total dissolved solids (TDS) and exhibits low levels of total suspended solids (TSS) and turbidity under low flow conditions. However, periodically, levels of salinity, TSS and turbidity exceed trigger values identified in the NSW Water Quality Objectives (WQOs) for the protection of aquatic ecosystems in upland rivers of the Manning River catchment, and ANZECC (2000) trigger values for the 95% protection of freshwater species. Total median nitrogen and phosphorous concentrations were above the WQO trigger levels for the 95% protection of aquatic species, as did a number of samples for cadmium, copper, chromium, lead and zinc. Samples collected across the Site generally exhibited slightly higher salinity and TSS values than the receiving waters.

Surface water within the Site would be separated and managed according to quality in the following manner.

- **Clean Water** – During the initial years of mining, clean water diversion channels would be constructed upslope of the overburden emplacements to direct upslope runoff away from the proposed operational areas. Following the successful stabilisation and revegetation of the areas of disturbance, the diversion channels would be decommissioned and surface runoff directed off site via natural and constructed drainage lines on the post-mining landform.

- **Sediment-laden Water** – Runoff from stockpiled subsoil, topsoil and most disturbed areas within the overburden emplacements would be directed to a series of sediment dams before being tested and released, once of an appropriate quality. Sediment-laden water of a quality which would not permit its release, would be used on site in the CHPP or for dust suppression.
- **Saline Water** – Groundwater seepage and surface runoff entering the open cut pits would be managed on site in a closed saline water management system and used for coal washing within the CHPP and for dust suppression within disturbed sections of the Mine Area. No water would be released from the saline water management system within the Mine Area.

The results of the site water balance indicate that the Proposal would have the capacity to store the projected groundwater seepage and surface water inflows and ensure that sufficient water would be available for ongoing operations such as on-site dust suppression and the CHPP throughout the life of the Proposal under a comprehensive range of rainfall scenarios.

Potential flooding impacts arising as a consequence of the Proposal were recognised in the design phase with the toe of the western and northern visibility barrier constructed to generally coincide with the 1 in 100 year Waukivory Creek/Avon River flood level. The barrier, together with the elevated internal haul road and end walls on the southern side of the Main and Weismantel Pits would act as flood levees and prevent any potential floodwater from entering the open cut pits.

Impacts of the western and northern visibility barrier and the conveyor on flood flows and behaviour would be negligible.

With the implementation of all surface water mitigation and management measures proposed for the Site, it is assessed that surface water would be appropriately managed with negligible impacts on the surrounding environment or downstream surface water users.

Groundwater

The following three distinct groundwater systems occur within the Site, each displaying differing yields and levels of permeability.

- Permian coal seams and interburden.
- Shallow weathered bedrock (regolith) with associated colluvial deposits.
- Shallow alluvium associated with the floodplains of Waukivory Creek and the Avon River.

The majority of groundwater to be intercepted throughout the life of the Proposal is associated with the Permian coal seams, with negligible groundwater intercepted from the overburden /interburden. Only limited quantities of shallow alluvial groundwater would be intercepted by the open cut pits.

Groundwater levels and gradients typically reflect the overlying topography, with a gentle gradient to the southwest occurring within the Site. The quality of the groundwater, ascertained from 15 monitoring bores developed across the Site on up to 26 sampling occasions, can be summarised as follows.

- pH does not substantially differ between groundwater sources and is typically neutral to slightly alkaline.
- Salinity varies between slightly brackish and moderately saline in the Permian coal seams, with water in the alluvium reflecting inflows of saline water (from the coal seams) near the margins of the alluvium.

A detailed groundwater assessment was undertaken for the Proposal, including groundwater modelling. The assessment determined that the limited volume of intercepted water from the alluvial system is adequately covered by the Applicant's existing entitlement for the Avon River Water Source, and complies with the relevant Lower North Coast Unregulated and Alluvial Water Sources Water Sharing Plan.

The assessment also concluded that:

- no surrounding groundwater users would be impacted by the Proposal;
- there would not be any reduced availability to the shallow groundwater system;
- there would be no impacts to any groundwater dependent ecosystem;
- there would be no measurable impact on flows within Waukivory Creek or the Avon River; and
- groundwater levels would recover within approximately 15 years after mine closure.

Groundwater monitoring will continue using a combination of the existing groundwater monitoring network and additional and/or replacement bores to further define baseline values and to provide an adequate dataset to determine trigger values for both groundwater quality and levels.

Terrestrial Ecology

More than 90% of the area to be disturbed is open pasture with some isolated remnant native vegetation ranging from low to good condition.

One Vulnerable Ecological Community (VEC) (a dry rainforest) was identified in the proposed disturbance area. No threatened flora species were detected during the comprehensive flora surveys.

A total of 59 threatened fauna species were identified from database and literature searches as likely to occur within a 10km radius of the Site (at least periodically), with this number subsequently refined to 36 species following the field habitat assessment and surveys. Of these, nine were observed within the Study Area.

The impact assessment identified that an effective 41.1ha of native vegetation within the 525ha proposed disturbance area would be impacted by the Proposal, comprising 35.7ha of Dry sclerophyll forest, 1.1ha of Riparian vegetation and 4.3ha of Rainforest.

An assessment of significance of impact has been carried out in accordance with *Draft Guidelines for Threatened Species Assessment* and the 7-part test of section 5A of the EP&A Act for the 36 threatened fauna species that could potentially frequent the Site and for the Rainforest VEC. It is concluded from the assessment of significance of impact that the Squirrel glider and Grey-crowned babbler are the only local populations of threatened species that may be impacted by the Proposal, i.e. along the northern section of McKinleys Lane. Potential impacts may occur from adjacent mining activities including light, noise, and blasting, and vehicles on the Mine Area access road, although the following ameliorative measures will largely mitigate these impacts.

- Retention of the roadside vegetation along the northern section of McKinleys Lane.
- Tree planting adjacent to Waukivory Road which has already been initiated.
- The progressive revegetation of the final landform to create woodland and native vegetation corridors to the north and east of McKinleys Lane.

A proposed 267ha Biodiversity Offset Area is to be established along the eastern and southeastern sides of the Mine Area, along the upper slopes on the Mograni Range and incorporating areas adjacent to Waukivory Creek, and be retained in perpetuity through a Voluntary Conservation Agreement. The offset area would consist of approximately 195ha of managed native vegetation including 45ha of low condition Dry sclerophyll forest which the Applicant would actively revegetate. Vegetated fauna corridors on the rehabilitated post-mining landform would provide linkages between the offset area and the remnant vegetation along the northern section of McKinleys Lane and Waukivory and Oaky Creeks.

Aquatic Ecology

Investigations into the existence and state of the aquatic ecology within and surrounding the Site determined that the aquatic environment is variable in condition, water quality and biota.

The existing habitats and aquatic communities in Waukivory Creek, Oaky Creek and the Avon River were assessed as being moderately to significantly impaired in terms of the stream condition and of moderate to poor habitat quality for fish. Notwithstanding this, the Avon River system as a whole is significant in that there are no major barriers to movement by fish between the Pacific Ocean and the upper sections of Waukivory Creek and the Avon River. Eels, which are migratory, were recorded during field investigations and anecdotal evidence indicates that other migratory fish such as Australian bass and mullet may also occur in streams adjacent to the Site.

The Proposal would not interfere with longitudinal connectivity (i.e. fish passage) within the Avon River system.

One threatened aquatic flora species was identified as potentially occurring within the Study Area. This species was not observed and it is considered unlikely that this species is present or that it would be impacted by the Proposal.

Three invasive aquatic fauna species were identified as occurring, or could occur, within the watercourses near the Site.

The Applicant's commitments to protecting water quality within Waukivory Creek and the Avon River would ensure the existing aquatic ecology would not be adversely impacted as a result of the Proposal.

Investigations have also shown that it is unlikely that stygofauna are present in substantial numbers within the groundwater beneath the Site, largely because of the presence of saline water in the groundwater system.

Soils and Land and Soil Capability

Five Soil Mapping Units (SMUs) have been identified within the Site, reflecting their locations on the upper, mid and lower slopes, the floodplains or in drainage lines.

With the exception of the SMU within the drainage lines, the physical and chemical properties of the remaining SMUs are acceptable for rehabilitation purposes as they display generally stable characteristics, moderate erodibility, and acceptable pH levels (with the potential requirement for lime to be added to some subsoils to enhance plant growth). Subsoils within the drainage lines display elevated salinity levels and will be placed directly into the interim or in-pit overburden emplacements.

The use of appropriate soil stripping, handling and stockpiling procedures, together with appropriate erosion controls would result in a minimal impact to soils within the Site.

Land and Soil Capability (LSC) Classes were determined based upon published mapping with additional field studies determining the majority of the Site contains LSC Classes 4 and 5 land (land with moderate to severe limitations), with the extreme eastern margin of the Site containing LSC Class 7 land (land with extreme limitations). There are no LSC Class 1, 2 or 3 lands within the Site or its environs.

The Site is not located on biophysical strategic agricultural land as outlined in the Strategic Regional Land Use Plan - Upper Hunter.

Following the completion of rehabilitation activities, land would be returned to the current LSC classes.

Transportation

The existing road and rail network has been reviewed and the potential impacts of the Rocky Hill Coal Project assessed for the site establishment and construction and operational phases.

Road Network

An analysis of the principal intersection, Jacks Road/The Bucketts Way, was undertaken using SIDRA intersection performance simulation software. The modelling indicates that, during the peak traffic periods associated with the Proposal, the intersection would continue to operate well below its capacity with no significant impacts, even in the event of no upgrading works. Considering that surrounding intersections generally have similar configurations and significantly less traffic, similar results would be anticipated.

Despite the outcomes of SIDRA intersection analysis, the following road and intersection works are proposed.

- Upgrades of Jacks Road/The Bucketts Way, Jacks Road/Waukivory Road and Waukivory Road/McKinleys Lane intersections.
- Upgrades of road pavement on Jacks Road and Waukivory Road (east of Jacks Road).
- Replacement of the single lane Avon River bridge on Jacks Road with a dual lane structure.
- A range of other minor upgrade works including line marking and signage.

The following specific management measures and safeguards would also be implemented to minimise road traffic-related impacts.

- Implementation of a Construction Traffic Management Plan.
- Implementation of a Driver's Code of Conduct for contractors and employees.
- Payment of a road maintenance contribution reflecting traffic generated and upgrade works completed.

The proposed upgrades would increase the road capacity, improve the structural integrity of the pavement and re-instate access to Waukivory Road from The Bucketts Way via Jacks Road which has been closed since April 2012 due to a lack of available funding from Gloucester Shire Council for its repair or replacement.

It has been assessed that, with the implementation of the proposed upgrades, mitigation and management measures, no significant impacts are expected upon the existing road network or road users as a result of the Proposal. Rather, the benefits arising from the proposed road and bridge works would benefit the community directly and indirectly well beyond the life of the Proposal.

Rail Network

The North Coast Railway Line is the principal rail route for the north coast of NSW, providing passenger and freight access northwards from Sydney to Brisbane and southwards to the Port of Newcastle.

The principal rail management issues would be the provision of safe access to and from the North Coast Railway Line.

The following specific management measures and safeguards would also be implemented to minimise rail traffic-related impacts.

- Adoption of a safety procedure and communication protocols for entering the North Coast Railway Corridor from the balloon loop.
- Installation of appropriate rail signals/modification of existing signals in accordance with ARTC standards and requirements.

It is concluded that, with the design, construction and operation of the rail loop and its interface with the North Coast Railway Line to ARTC requirements, and the implementation of appropriate safety procedures, no significant impacts to rail safety or efficiency are anticipated as a result of the Proposal.

Indigenous Heritage

A search of the Aboriginal Heritage Information Management System (AHIMS) identified three previously registered sites within the Site, comprising open scatters and a potential archaeological deposit. Field surveys undertaken in conjunction with registered Aboriginal stakeholders identified an additional six sites, resulting in a total of nine sites occurring within the Site. An additional survey was completed by the Project archaeologist over the proposed route for the relocated Power Line Corridor external to the Mine Area, with no sites found.

Of the nine sites identified within the Site, eight will be salvaged and their contents relocated to a secure place, with three of these sites being subject to further subsurface investigations. The remaining identified site would not be disturbed.

An Aboriginal Cultural Heritage Management Plan would be prepared following receipt of development consent. The Plan would outline the approach to salvaging the identified sites and the education of the mine workforce on Aboriginal heritage identification and procedures to follow if any currently undiscovered sites are identified throughout the life of the Proposal.

The implementation of the Aboriginal Cultural Heritage Management Plan and the subsequent salvage and storage of identified sites, as agreed upon by the registered Aboriginal stakeholders, would result in no significant impacts to Aboriginal heritage.

Non-indigenous Heritage

A non-indigenous heritage assessment was undertaken for the Proposal in conjunction with the visibility assessment of the Stroud-Gloucester Valley. This assessment was supported by a historical archaeological assessment.

A search of the relevant heritage databases, revealed that there are no recorded non-indigenous heritage sites within or immediately surrounding the Site. The only possible site was a cottage on the "Aminya" property which was established to have no historical significance.

A Statement of Heritage Significance and a Statement of Heritage Impact were completed, resulting in the conclusion that whilst the Stroud-Gloucester Valley displayed certain qualities, the non-indigenous heritage landscape would not be significantly affected by the Proposal.

Socio-economic

A comprehensive, independent social and economic assessment was undertaken and involved an analysis of the available socio-economic data together with the results of qualitative research undertaken with local people and organisations to identify the full range of potential issues and opportunities arising from the Proposal within the community. Where appropriate, an analysis was also conducted of broader impacts at the State and National level. The research established there is a diversity of views in the local Gloucester community regarding the positive and negative impacts of the Proposal.

A range of potential social impacts, including health, social infrastructure capacity, community sense of place, social cohesion, housing, employment and cumulative impacts were analysed together with potential economic impacts.

A total of 23 recommendations were made in the socio-economic assessment to manage and mitigate the potential socio-economic impacts and maximise the socio-economic benefits. These recommendations have been accepted by the Applicant in addition to their existing commitment to establish a Community Grants Program and a range of other sponsorship and training opportunities.

The Proposal would result in significant economic benefits to the local, regional, State and national economies, including the following.

Local/Regional

- Direct employment for approximately 100 full-time equivalent people during site establishment and construction phase, generating approximately \$10 million in wages and other entitlements, with this sum increasing to approximately \$20 million per year once full employment of approximately 150 equivalent full-time jobs and full production are reached.

- Contribution of between \$7 million and \$8 million throughout the life of the Proposal to the local community as part of the Community Grants Program.
- Payment of more than \$3 million in additional rate revenue to Gloucester Shire Council over the life of the Proposal (approximately \$250 000 annually) as a consequence of Council's differential rating policy.
- Direct local spending by employees of between \$3.1 million and \$8.0 million annually once full production is achieved with a local flow-on benefit of between \$7.1million and \$18.5million annually.

State

- Approximately \$204 million to the NSW State government comprising \$186 million in royalties and \$17.6 million in State payroll tax through direct and indirect employment.
- Approximately \$3 million to the COAL21 scheme implemented by the Australia Coal Association.

Commonwealth

- Payment to the Commonwealth government of in excess of \$563 million in taxation obligations throughout the life of the Proposal.

Over the operational life of the Proposal, local and State economies would benefit from direct expenditure by more than \$250 million and \$1.3 billion respectively. The combined value to the Australian economy is estimated at \$3.6 billion when flow-on multiplier effects are taken into account.

Although a range of perceived or actual negative social and economic impacts could potentially occur, on balance, the socio-economic assessment has concluded there would be a net social and economic benefit associated with the Proposal.

PROJECT EVALUATION AND JUSTIFICATION

The Rocky Hill Coal Project has been evaluated and justified in light of the assessment of the Proposal's potential impacts on the environment and potential costs and benefits to the local and wider community.

The evaluation of the Proposal was undertaken in the framework of a risk assessment protocol (including consideration of operational mitigation measures and the principles of ecological sustainability). The evaluation has found that with the implementation of the proposed comprehensive range of operational controls, and where necessary additional mitigation measures, the residual risk posed by the various potential environmental risk sources would be acceptable and therefore enable the Proposal to proceed. With few exceptions, the residual risks were classified as either medium or low.

The Applicant recognises that any residual risks classified as high will require detailed and comprehensive management strategies to effectively manage, and where possible reduce, the impacts upon the surrounding environment.

The Proposal has addressed each of the principles of ecological sustainable development with a conclusion reached that the Proposal achieves a sustainable outcome for the local and wider environment.

The Proposal has also been justified in terms of a wide range of biophysical, social and economic issues. These impacts have been justified in terms of the low risk of adverse environmental outcomes and the positive economic and social benefits that would result for the local and regional community and for the State and Commonwealth.

CONSEQUENCES OF NOT PROCEEDING WITH THE PROPOSAL

In the event the Proposal does not proceed in the manner proposed, the following outcomes would not eventuate.

- Employment opportunities for numerous Gloucester and district residents.
- Direct expenditure in the local economy totalling more than \$250 million and for the NSW economy totalling more than \$1.3 billion.
- Additional rates revenue to Council of more than \$3 million.
- Additional beneficial environmental and related outcomes from the Proposal such as road and bridge works which would otherwise not eventuate or need to be financed by Council.
- The various impacts predicted to occur as a result of the Proposal.

Based on the demographic projections for Gloucester, other likely outcomes from the no development option, would include:

- a small and decreasing population growth;
- low levels of population growth-generated employment;
- a continued exodus of people in primary working years;
- an increase in the percentage of the population over 55 years of age and the ratio of people not working relying on those that are working;
- inadequate jobs ratio growth to meet demand;
- outmigration to neighbouring employment centres; and
- a real reduction in rates earnings by Council.

CONCLUSION

The proposed Rocky Hill Coal Project has, to the extent feasible, been designed to address the identified concerns of the local community and the environmental criteria nominated by the State government. The Proposal would provide for the mining, processing and despatch of high quality coal products largely destined for export markets.

The use of real-time air quality and noise monitoring, predictive meteorological monitoring and diligent management would enable the Applicant to successfully develop and operate the Proposal with a standard of environmental management which would satisfy both environmental criteria and reasonable community expectations.

The proposed rehabilitation activities and final landform including no final void or open pit, would allow the progressive re-instatement of the land within the Mine Area for agricultural purposes and demonstrate the Applicant's recognition of the values attributed to an E3 zoning.

The Proposal would provide sought-after employment, particularly for young people, which in turn would provide a boost to the local economy.

This *Environmental Impact Statement* concludes that provided the proposed management and mitigation measures are adopted, the Proposal could be constructed and operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives and reasonable community expectations.